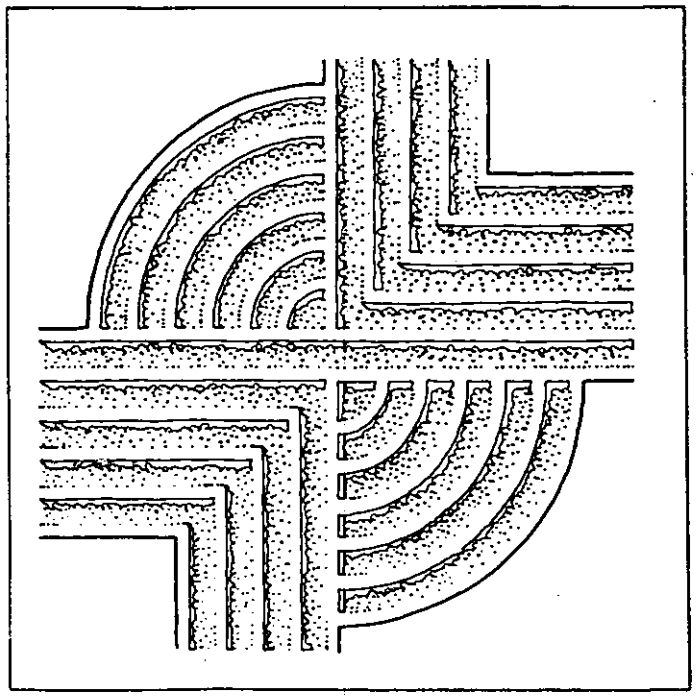
FORT BRAGG 4: AN ARCHAEOLOGICAL SURVEY OF THE 625.73 HA HOLLAND DROP ZONE AND 243.81 HA ON FORT BRAGG, CUMBERLAND AND HOKE COUNTIES, NORTH CAROLINA



CHICORA FOUNDATION RESEARCH SERIES 204

FORT BRAGG 4:
AN ARCHAEOLOGICAL SURVEY OF THE 625.73 HA HOLLAND DROP ZONE AND 243.81 HA ON FORT BRAGG, CUMBERLAND AND HOKE COUNTIES, NORTH CAROLINA

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Chicora Research Contribution 204

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ABSTRACT

This study represents an intensive archaeological survey of four areas under the oversight of Fort Bragg, North Carolina totaling 869.54 ha. One is designated as the Holland Drop Zone. This tract, located in Hoke County, North Carolina, contains approximately 625.73 ha. The other survey tracts are given the alphabetical designations, "A," "B," and "C", and are situated in Cumberland County, North Carolina. Survey tract "A" contains 157.95 ha, survey tract "B" contains 18.63 ha, and survey tract "C" contains 67.23 ha.

This work is being done in order to fulfill compliance with the National Historic Preservation Act (Public Law 89-665, as amended by Public Law 96-515), Guidelines for Federal Agency Responsibilities, under Section 110 of the National Preservation Act, Army Regulation AR 420-40, and 36CFR800 (Protection of Historic and Cultural Properties). The project is administered for the United States Army by the National Park Service (NPS), Southeast Regional Office. The scope of work specified that certain tracts within the project area be surveyed as low probability using transects and shovel tests spaced at 50 m intervals, whereas other tracts were to be surveyed as high probability using transects and shovel tests spaced at 30 m intervals .

The primary purpose of this investigation is to identify and assess the archaeological remains present at Fort Bragg for the National Register of Historic Places. There were also a number of secondary goals which included:

- an examination of changing prehistoric and historic land use;
- the affects of clear-cutting and long-term exposure on archaeological sites;
- the effectiveness of 30 m interval transects at locating significant resources;
- changing lithic material preferences; and
- site function/duration based on artifact content.

These investigations incorporated a review of the site files at the North Carolina Office of State Archaeology. Although a number of surveys have been conducted in adjoining areas only nine sites, in the Holland Drop Zone tract, were previously recorded. No previously recorded sites were found to exist within any of the other survey tracts.

A total of 43 sites and isolated occurrences were identified in the Holland Drop Zone tract. No sites were located in survey tracts "A" through "C". Of the 43 archaeological sites identified, only one (31HK23*) is recommended potentially eligible for inclusion on the National Register of Historic Places. The remaining 42 sites are recommended as not eligible for inclusion on the National Register of Historic Places.

All 43 sites have only prehistoric components. Thirty-four of the 43 sites exhibit only lithic debitage or other non-diagnostic material. Lithic assemblages from two sites indicate an Archaic occupation. A Woodland assemblage is found at four sites and a combined Archaic/Woodland assemblage is found at two sites. Prehistoric pottery from one of these sites also indicates a Woodland Period occupation.

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ACKNOWLEDGEMENTS

While the work at Fort Bragg was conducted in compliance with various national historic preservation requirements, we wish to thank all of those involved for their support and interest in the project. In particular, at Fort Bragg Mr. Wayne Boyko (Fort Archaeologist) and Ms. Bev Boyko (Collections Curator) provided guidance and good humor. We thank them for their help. Mr. Mark Jones of Integrated Training Area Management provided us with GPS assistance.

Dr. David G. Anderson (National Park Service) administered the project for Fort Bragg. We appreciate his interest, encouragement, and confidence. Ms. Kimberly Washington (National Park Service) assisted us in navigating the paperwork for payment — a seemingly essential component of science.

We would also like to thank Ms. Almeta Rowland-White and Dr. Billy Oliver of the North Carolina Office of State Archaeology for providing direction for the background research, for clarifying curatorial issues, and for review comments.

This is a unique opportunity to explore the archaeology of a section of North Carolina which has received relatively little attention. The job, however, has been made much easier by the tremendous number of individuals who have gone before us and on whose work we have repeatedly relied. Some were instructors, some were colleagues, some were collectors, a few crossed these lines, and a very precious few were also friends.

The success of this project is largely due to the dedication and professionalism of the field crew which included Ms. Sabrina Buck, Mr. Jonathon Decker, Mr. John Hamer, Mr. Scott G. Sutton, Ms. Michelle Smith, and Mr. Matt Weaver. The surveys were conducted from August 20 to September 27, 1996 and we appreciate their dedication and hard work. Thanks also to Ms. Rachel Brinson-Marrs who cataloged and processed the collections for curation.

INTRODUCTION

Survey Background

Investigation of the 625.73 ha Holland Drop Zone and the 243.81 ha Fort Bragg general survey areas was conducted by Mr. William B. Barr of Chicora Foundation, Inc. for the National Park Service. Located in south central North Carolina, Fort Bragg encompasses portions of Cumberland, Harnett, Hoke, Moore, Richmond, and Scotland counties (Figure 1).

Although the base covers portions of six counties, the Holland Drop Zone survey tract is entirely located within Hoke County. Survey tracts "A" through "C" are all located in Cumberland County (Figure 2).

Only one major North Carolina highway, NC 24/87, which travels north-south, runs through Fort Bragg. Other roads within the base consist of a system of paved cantonment roads, perimeter and firebreak roads, along with random two-rut vehicle tracks that allow access to different portions of the base. The Holland Drop Zone survey tract is located in the northwest portion of Hoke County and borders Moore County to the north and west. Survey tracts "A" through "C" are located within the confines of the Fort Bragg cantonment area.

The Holland Drop Zone survey tract, located southeast and southwest of the intersection of Manchester and Longstreet roads. The northern boundary of the survey tract is defined by Manchester Road. The eastern boundary is determined by the western drainage of Tuckahoe Creek and McArthur Lake. The southern boundary is defined by the northern drainage of Piney Bottom Creek and the western boundary borders Firebreak Road 24 (Figure 3).

The drop zone is partially wooded to the south and east. The remainder of the survey tract was clear cut a number of years ago to be used as a parachute drop zone. Although today, small, isolated clusters of trees may be found within the central portion of the drop zone the vast majority is covered in sparse grass (Figures 6 and 7). The central portion is void of all vegetation (Figure 8). A number of small sand dunes are found in the flat upland areas of the tract.

The general survey of Fort Bragg includes three locations. Although all contain wooded areas consisting of mixed hardwood and pine, each has site specific characteristics pertaining to their particular location on base.

Survey tract "A" is a wooded area which lies southeast of the intersection of Longstreet and McRae Ride roads. Longstreet Road constitutes the northern boundary and McRae Ride Road forms the western boundary. This tract is bordered on the east by McPherson Creek and an unnumbered firebreak road. The southern boundary of the survey tract is also bordered by an unnumbered firebreak road (Figures 4 and 9).

Survey tract "B" is a wooded area which lies southeast of the intersection of Gruber and Rakksan roads. The northern boundary is formed by Gruber Road. The eastern and southern boundaries are formed by a drainage of Beaver Creek. The western boundary is formed by a gravel extension of Rakksan Road which extends south of Gruber Road (Figures 5 and 10).

Survey tract "C" is a wooded area which lies southwest of the intersection of Longstreet and Gruber roads. Longstreet Road forms the northern boundary and Gruber Road forms the eastern boundary. The tract is bordered to the south and west by unnamed firebreak roads. The eastern section of the survey tract contains a number of buildings related to Fort Bragg military operations (Figures 4 and 11).

All survey tracts were designated as either

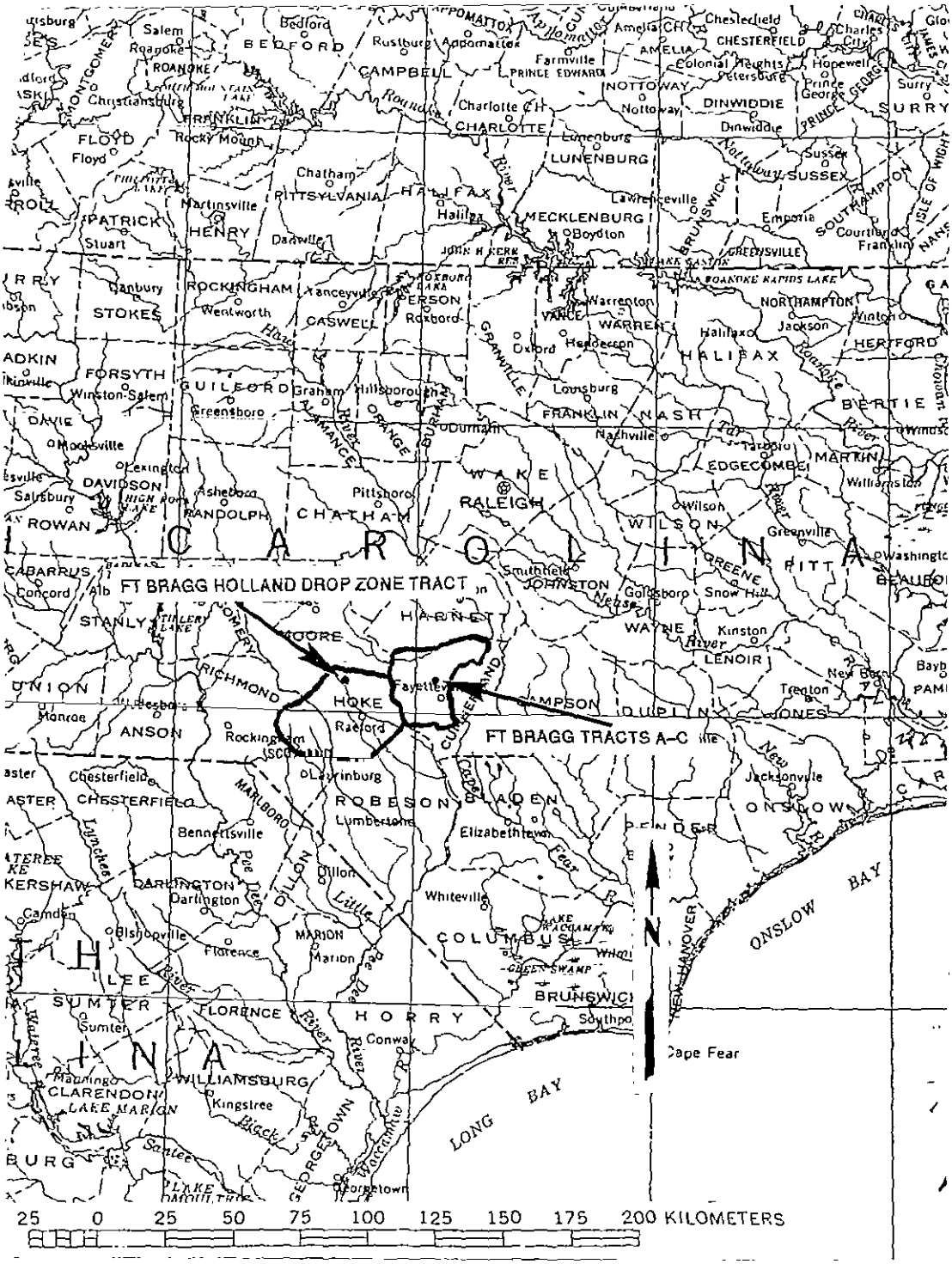

Figure 1. Location of the project areas in Hoke and Cumberland counties, North Carolina (USGS United States 1972 1:250,000).

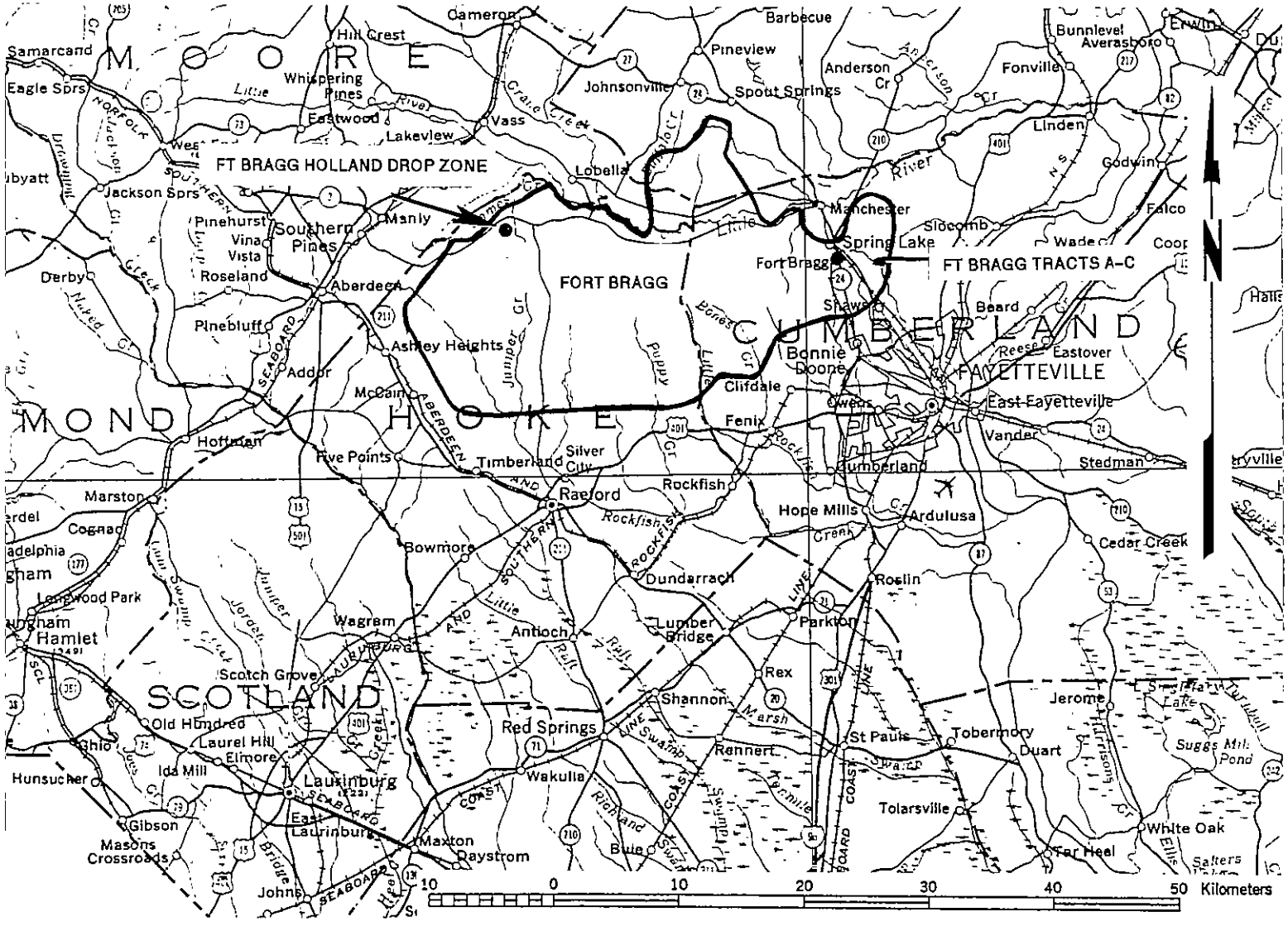

Figure 2. Location of the Holland Drop Zone survey tract and Fort Bragg general survey tracts "A" through "C" in Hoke and Cumberland counties, North Carolina.

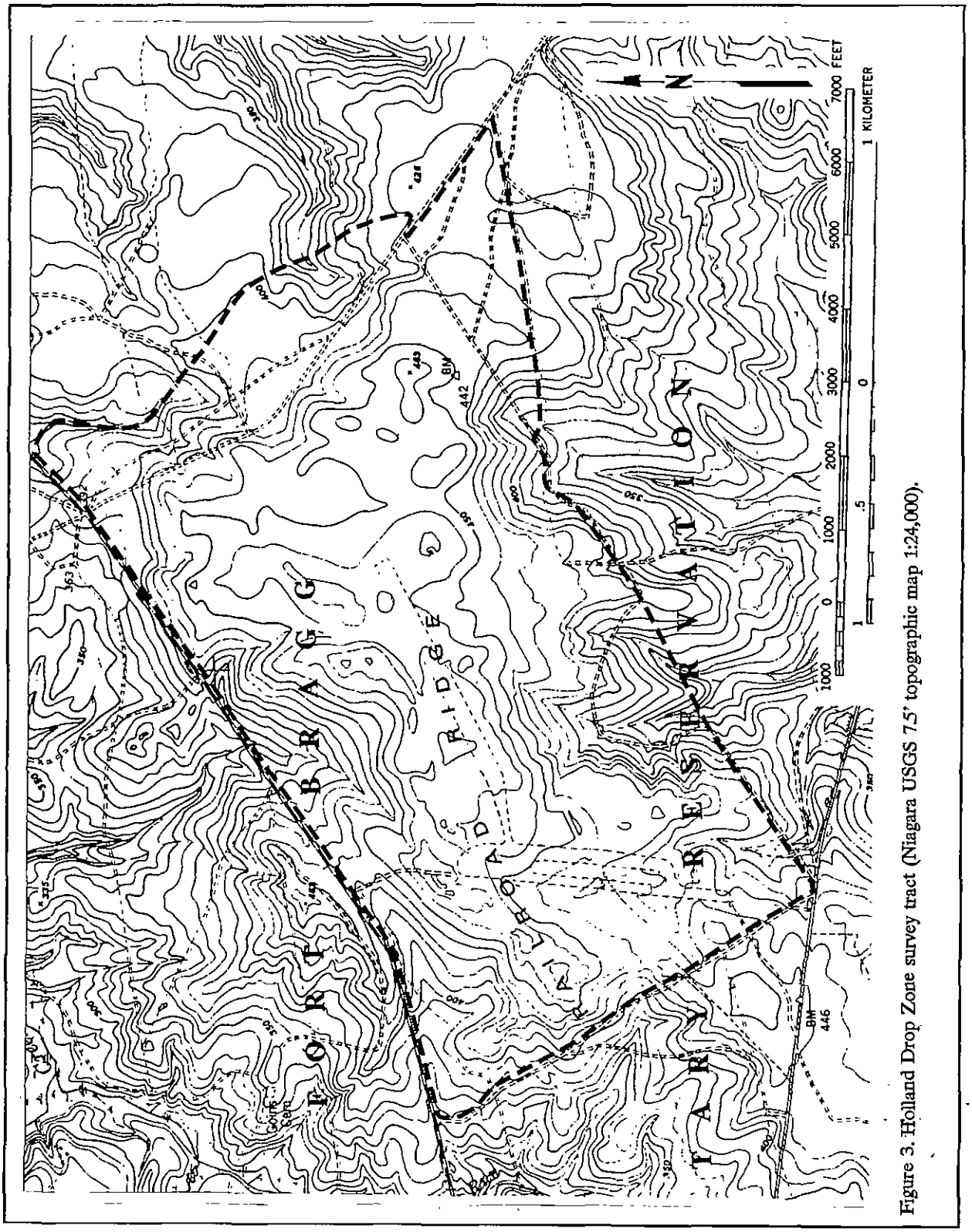

Figure 3. Holland Drop Zone survey tract (Niagara USGS 7.5' topographic map 1:24,000).

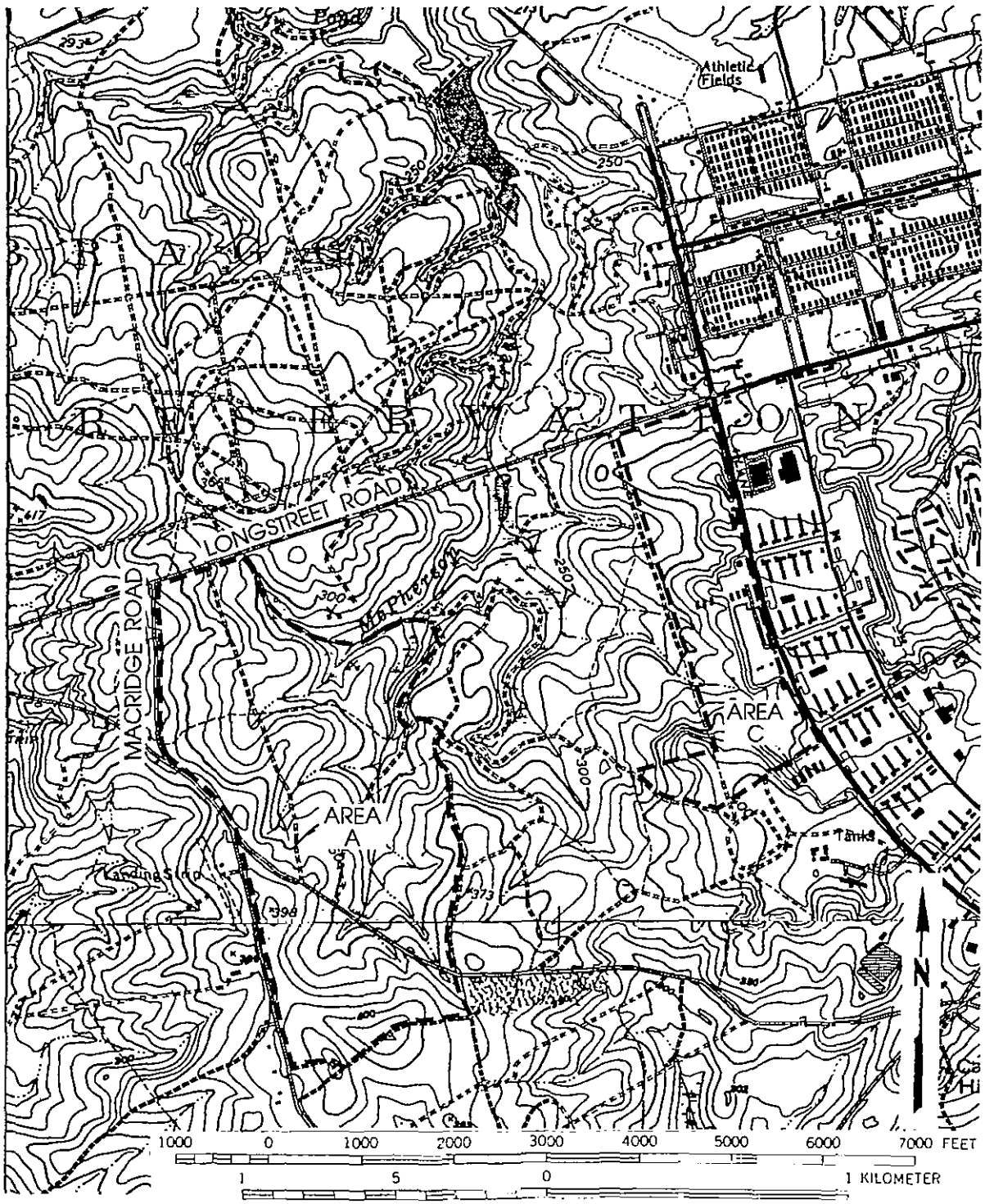

Figure 4. Fort Bragg general survey tracts "A" and "C" (Overhills USGS 7.5' topographic map 1:24,000).

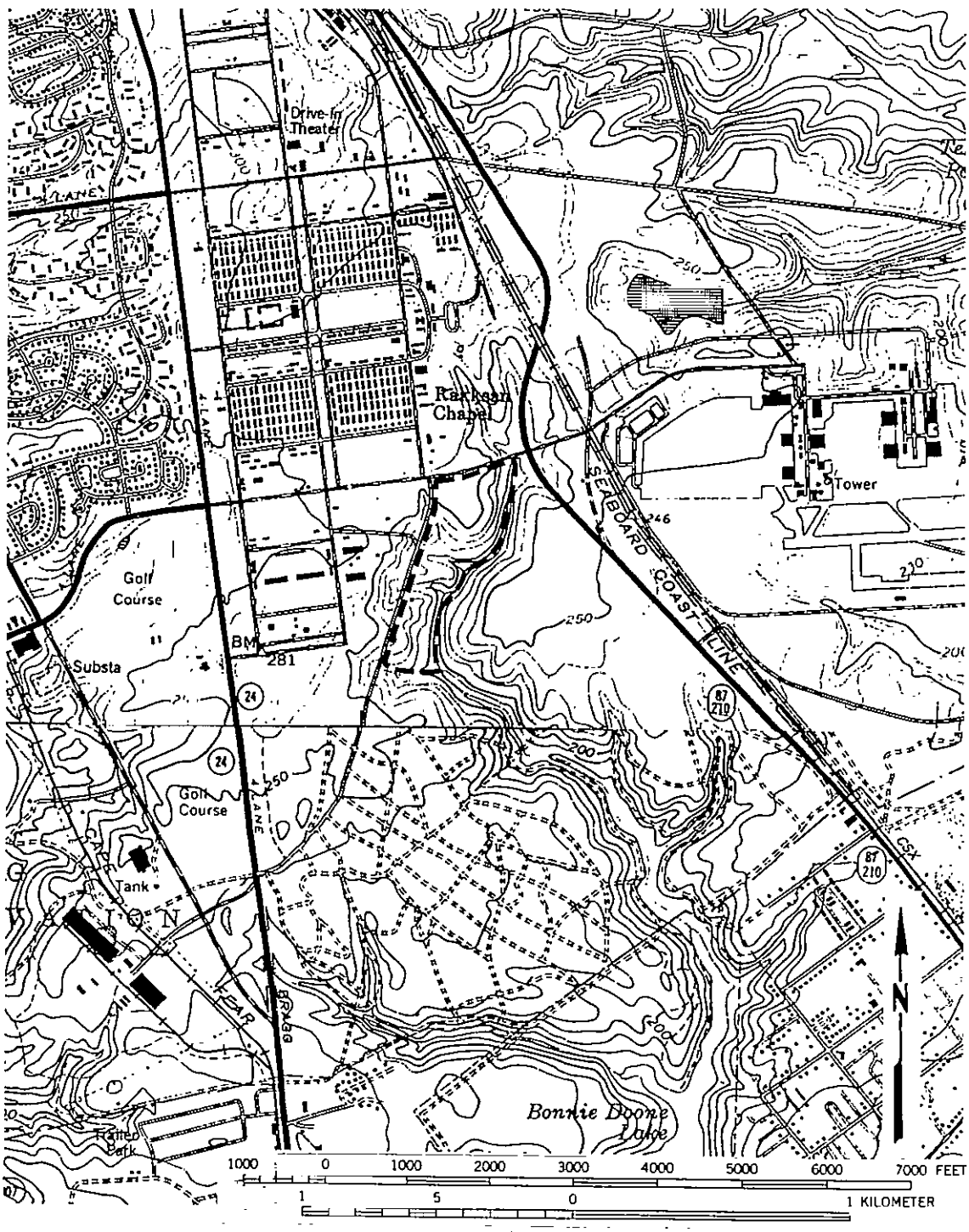

Figure 5. Fort Bragg general survey tract "B" (Overhills USGS 7.5' topographic map 1:24,000).

Figure 6. General topography and vegetation of Holland Drop Zone, view to the north.

Figure 7. Vertical view of vegetation found on surface of Holland Drop Zone survey tract.

Figure 8. General topography and vegetation of Holland Drop Zone, view to the west.

Figure 9. General topography and vegetation of survey tract "A", view to the north.

Figure 10. General topography and vegetation of survey tract "B", view to the north.

Figure 11. General topography and vegetation of survey tract "C", view to the east.

high or low probability. The Holland Drop Zone, as well as survey tract "B," were designated as high probability areas. These tracts were examined using transects spaced at 30 m intervals. Shovel tests were placed at 30 m intervals along these transects. Survey tracts "A" and "C" were designated as low probability areas. These tracts were examined using transects spaced at 50 m intervals. Shovel tests were placed at 50 m intervals along these transects. Once an archaeological site was identified, the area was shovel tested on a cardinal grid pattern at 10 m to 15 m intervals, with the interval of testing determined by site size. In addition, at least one 50 cm square test unit was excavated at each recorded site.

Measurements, in compliance with the National Park Service scope of work, were taken using metric units. In order to maintain consistency throughout this research, all measurements are provided using metric units and Table 1 provides conversions to English measures. The only exception is that of contours on site maps. These measurements, taken from United States Geological Survey maps, are in feet.

These investigations incorporated a review of the site files at the North Carolina Office of State Archaeology. This review consulted all known published reports and/or preservation plans which may exist regarding previous research at Fort Bragg. Although a number of previously recorded sites were identified by Dr. Thomas Loftfield (1979) as a part of a general reconnaissance survey of Fort Bragg, Camp Mackall, and Simmons Army Air Field, only nine of those previously identified sites were found to exist within the confines of the present survey boundaries. In addition, the fort's Historic Preservation Plan (Braley 1990) and independent studies (Jameson 1986) were consulted regarding sites or structures on the National Register of Historic Places within all survey tracts. Additional information concerning data recovered by Loftfield (1979) and Braley (1990), can be found in the Research Strategy and Methods section, as well as the Conclusions.

Only prehistoric sites were located in the Holland Drop Zone survey tract. No evidence of any historic occupation was found to exist in this survey area. No prehistoric or historic cultural resources were found to exist in survey tracts "A" through "C." A total of 43 sites and isolated occurrences were identified during the survey and all were located in the Holland Drop Zone survey tract. Of these 43 sites, 13 contained enough cultural resources to be classified as prehistoric sites, whereas 30 were determined to be prehistoric isolated occurrences.

Table 1.
Metric Equivalents

LENGTH		
kilometer	km	0.62 miles
meter	m	39.37 inches or 3.28 feet
centimeter	cm	0.39 inches
millimeter	mm	0.04 inches
AREA		
hectare	ha	2.47 acres
square km	km^2	0.3861 square miles
WEIGHT		
metric ton	t	1.1 English tons

TEMPERATURE
C to F = (°C x 1.8) + 32 = °F

Of the archaeological sites identified, only one is recommended as potentially eligible for inclusion on the National Register of Historic Places. The remaining sites are recommended as not eligible for inclusion on the National Register and no further management activities are necessary. The Base Archaeologist, however, may wish to continue monitoring these sites. The additional data may prove useful to our understanding of settlement, in particular, spatial patterning and density, as well as the process of site destruction through artificial means.

The majority of sites from the Holland Drop Zone survey tract contained nondiagnostic debitage. Eleven of these sites contained definable

artifact concentrations. These components span the Archaic and Woodland periods. The most common Woodland component was the Yadkin Phase, represented by pottery recovered from site 31HK562* and lithics from sites 31HK561*, 31HK562*, 31HK564*, 31HK566*, 31HK572*, 31HK576*, and 31HK580*. An identifiable Archaic Period component was found at sites 31HK23*, 31HK551*, 31HK562*, 31HK566*, and 31HK573*. Sites which contained both an Archaic and Woodland component included 31HK562* and 31HK566*.

Surveys were conducted from August 20, 1996 to September 27, 1996. The Principal Investigator was Dr. Michael Trinkley. The Field Director for the project was Mr. William B. Barr and Mr. Scott G. Sutton served as Crew Chief. Field crew consisted of Ms. Sabrina Buck, Mr. Jonathan Decker, Mr. John Hamer, Ms. Michelle Smith, and Mr. Matthew Weaver.

Curation

Archaeological site forms have been filed with the North Carolina Office of State Archaeology. The field notes, photographic materials, artifact catalogs, and artifacts resulting from these investigations have been curated at Fort Bragg using their accessioning and cataloging system. All records and duplicate copies have been provided to Fort Bragg and will be maintained by that institution in perpetuity.

NATURAL SETTING

Physiography and Drainage

Fort Bragg, which encompasses about 60,000 ha, forms a roughly rectangular shape measuring approximately 19 km north-south by 44 km east-west. The fort's most distinctive feature is perhaps its diversity of relief. Elevations range from about 63 meters in the west to about 155 meters in the northeast along Gibson Creek. Scattered across the base are several "hills" about 30 meters higher than the surrounding topography. Loftfield observes that the extremes in topography "have been exaggerated by an erosive process on the sandy soils along the numerous streams" (Loftfield 1979:3).

The drainage pattern of the Fort Bragg area (well illustrated by Loftfield 1979:Figure 1), consists of a number of relatively small streams and creeks flowing either north or south from an east-west ridge that runs through the center of the Fort Bragg reservation. Those to the south flow into the Cape Fear River, while those to the north flow into the Lower Little River (which empties into the Cape Fear). Rockfish Creek, the headwaters of which originate on Fort Bragg, serves as the major drainage for the creeks in the western portion of the base.

Fort Bragg is situated entirely within the Sandhills physiographic province — a narrow band of ancient marine sediments sandwiched between the Coastal Plain, about 18 km to the southeast, and the Piedmont, about 50 km to the northwest (Figure 12). Almost every previous study on the base mentions that the Sandhills seem to be a favorite location for military installations (such as Fort Jackson, South Carolina and Fort Gordon, Georgia) — the land being cheap, and the climate and topography offering the potential for year-round use.

The 625.73 ha Holland Drop Zone survey tract is located in northwestern Hoke County. The three Fort Bragg general survey tracts, totaling 243.81 ha, are located within Cumberland County, North Carolina. All of the survey areas, like the remainder of the base is situated in the Sandhills region of the Upper Coastal Plain physiographic region and are located in the south central portion of North Carolina. Cumberland County is bounded to the north by Harnett County, to the east by Sampson County, to the south by Bladen County, to the southwest by Robeson County, and to the west by Moore and Hoke Counties. Hoke county is bordered to the north and northwest by Moore County, to the east by Cumberland County, to the south by Robeson County, and to the southwest by Scotland County. Richmond County intersects Moore, Hoke, and Scotland counties at the westernmost portion of Hoke County.

The topography of these two counties consists of gently undulating hills with elevations ranging from about 61 m to 152 m above sea level. The Sandhills are characterized by broad, sandy ridges and long, less sandy side slopes (Hudson 1984:2). Elevations within the Holland Drop Zone range from a low of 119 m above mean sea level (AMSL) in the west to a high of 141 m AMSL in the east. Within the Fort Bragg general survey tracts, elevations range from a low of 61 m AMSL in survey tract "B" to a high of 122 m AMSL in survey tract "A".

The northern portion of Cumberland County is drained by the Lower Little River which drains into the Cape Fear River. Several small creeks drain the central portion of the county. To the north, Carvers Creek, Cross Creek, and Little Cross Creek drain directly into the Cape Fear River. To the south, Stewarts Creek drains into Beaver Creek. Bones Creek, Beaver Creek, and Buckhead Creek all drain into Rockfish Creek which flows east to the Cape Fear River. The South River forms the western boundary of Cumberland county. The western third of Hoke

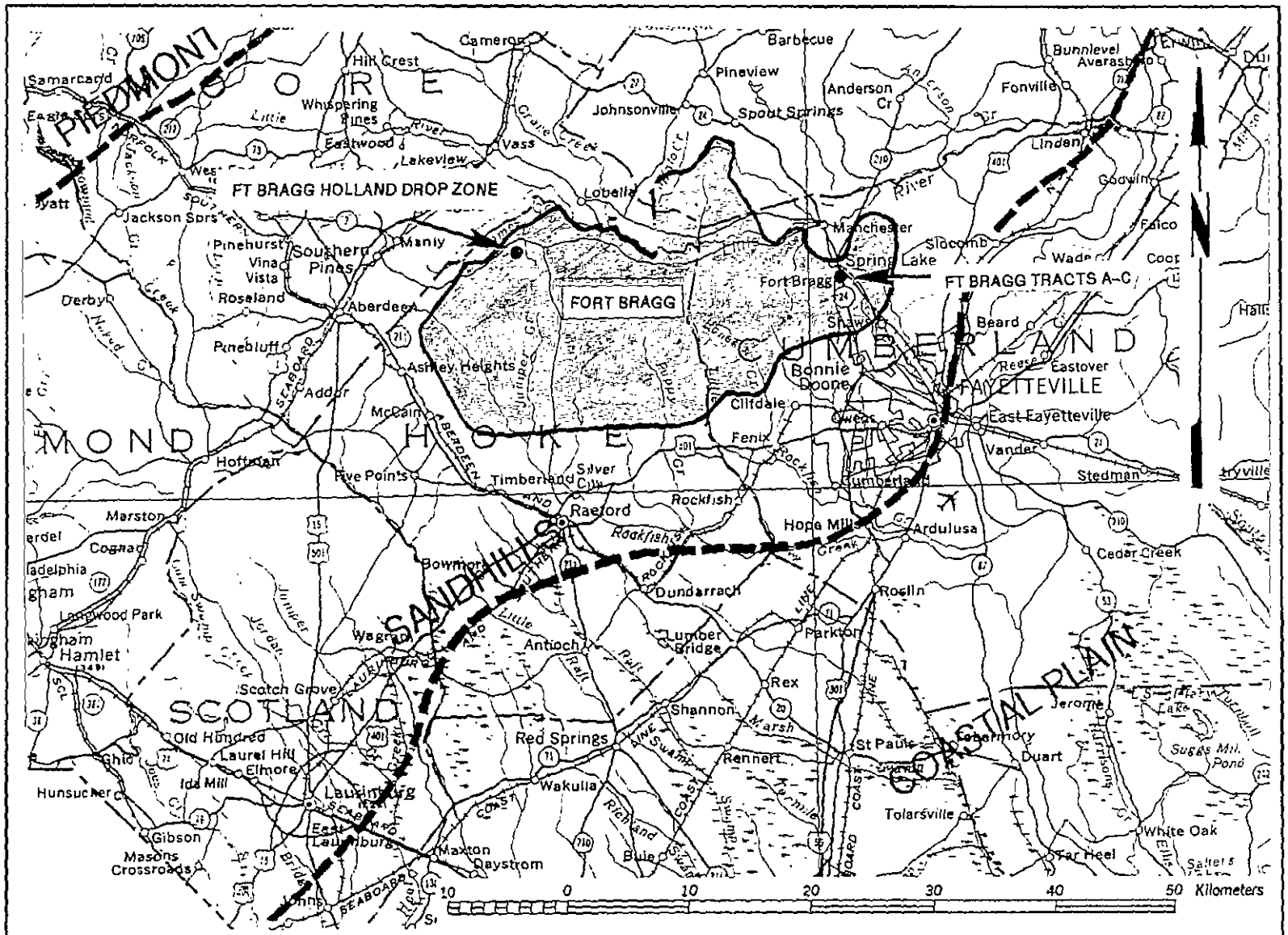

Figure 12. Physiographic setting of Fort Bragg in the Sandhills and the location of the four study tracts.

County is drained by the Lumber River while the eastern two-thirds is drained by creeks which flow into the Cape Fear River. These include the Lower Little River along the northern border of the county and Little Rockfish Creek along the eastern border of the county. Jumping Run Creek and Deep Creek drain the project area, flowing into Lower Little River. According to the State Board of Agriculture:

> [t]hrough the pine lands run numerous bold, strong and swiftly flowing streams, never diminished by drought and rarely excited by freshet. These, from the earliest settlement, furnished convenient mill-sites, and originated that active lumber industry so stimulating to the prosperity of the county and that the towns on the Cape Fear river; and, up to the successful introduction of cotton manufacture into the State, their power was speedily applied to the use of cotton-mills, which were built in the town of Fayetteville, on Cross and Blount's creek, on Buckhead, Beaver Dam and Rockfish (two of these) creeks, and on Lower Little River; and on all of these there are now large and flourishing cotton factories (State Board of Agriculture 1896:327).

As evidenced by the current vegetation throughout this survey, large areas of Fort Bragg have been clear cut for fields at one time. As a result, there have been some changes in the original physiography and drainage of the area. Over time, the topography of hills and drainages in these survey tracts have become less sharp and more gentle. It is possible that some sites, which today are found far from flowing water, had creeks or springs which flowed much closer to the site. A good example is 31HK568*. The site is located on a small terrace adjacent to a drainage rim. The southern drainage of James Creek is located 1,700 m northwest of the site (Figure 13).

The Fort Bragg general survey tracts all contain some wooded areas and exhibit a mixture of hardwood and pine. Survey tract "B" is drained by Beaver Creek which flows south and east into the Cape Fear River. The nearest drainage to survey tract "A" and "C" is McPherson Creek which flows north between the two survey tracts and drains into the Little Lower River.

Geology and Soils

Hudson (1984:2) describes the geology of the area simply as several layers of unconsolidated sediment (primarily of the Tuscaloosa Formation, deposited in the Upper Cretaceous period) underlain by bedrock which is composed of volcanic slate. This bedrock is generally 62 to 125 m below surface; however, near the town of McCain (just west of Fort Bragg), bedrock is found at about 34 m below surface. No bedrock is known to be exposed anywhere in the area.

Immediately available lithic resources consist of river pebbles that are of a relatively high quality quartz and found in gravel bars of the Lower Little River and the larger tributaries. Metavolcanic rock does not outcrop on Fort Bragg. However, there is a source located a relatively short distance away, about 16 km, on the Hoke-Moore county line (North Carolina Department of Conservation and Development 1958). Even greater numbers of resources are available in the Slate Belt, just within the Piedmont. Igneous rocks within the Slate Belt include rhyolite, andesite, and intrusive quartz veins.

Traditionally the soils of Cumberland and Hoke counties have been identified as Norfolk-Ruston and Norfolk Sands (U.S. Department of Agriculture 1939:1069-1072). The Norfolk-Ruston soils were associated with the Coastal Plain, while the Norfolk Sands were associated with the Sand Hills. In neither area has the climate favored the development of organic matter, so the soils are light-colored, predominantly sandy in the surface horizon, and range from coarse sands to fine sandy loams. Almost all are medium to strongly acid in reaction. The occurrence of these soils in the

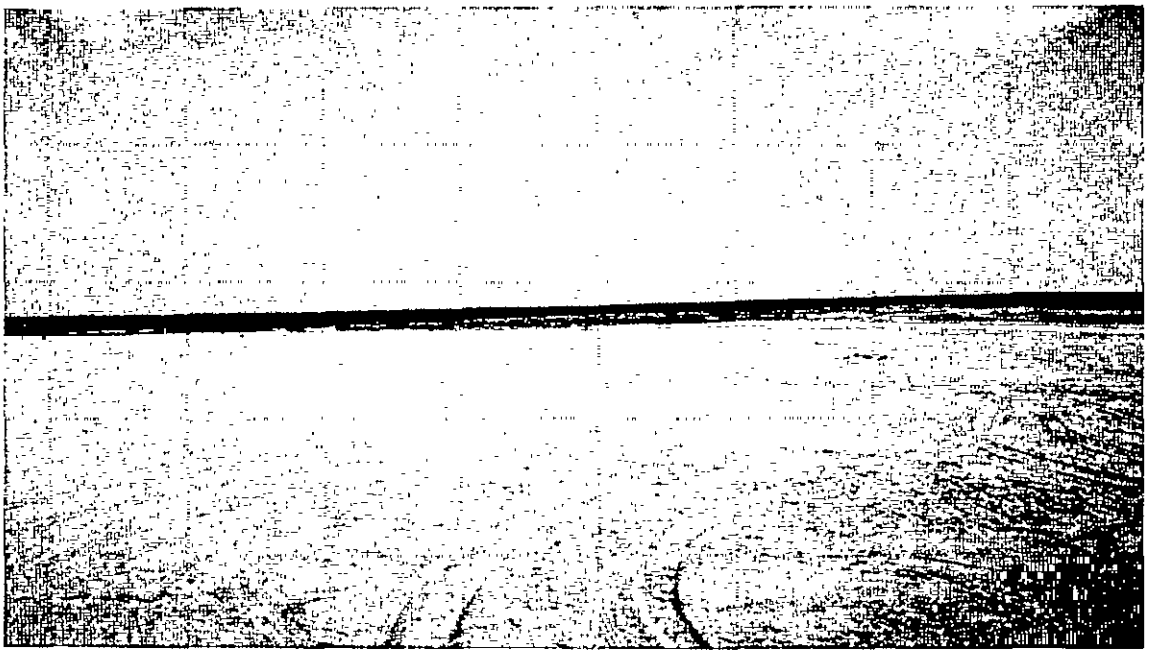

Figure 13. Slope to intermittent drainage at 31HK568*, view to the west.

survey tracts is discussed below.

Today, modern soil science identifies six primary soil associations in Hoke County and 10 in adjacent Cumberland County, although only two are associated with Fort Bragg — the Blaney-Gilead-Lakeland Association and the Wagram-Faceville-Norfolk Association. The former is characterized by excessively drained to moderately well drained soils on highly dissected uplands while the latter is characterized by well drained to poorly drains soils found on broad, smooth uplands (Hudson 1984).

The soils in the Holland Drop Zone project area are all well drained. The tract is characterized by Blaney, Candor, Johnston, Lakeland, and Vaucluse soils (Figure 14). The most prominent soil type is somewhat excessively drained Candor sand which is found on about 70% of the project area. Blaney sands are excessively drained and found on about 20% of the project area. The other minority types, in order of prominence, are well drained Vaucluse loamy sand, well drained Vaucluse sand, and excessively drained Lakeland sands. Although this study produced a very small sample, most of the sites found in the project area occur on Blaney and Candor soils, although one site was found on Vaucluse sand. This suggests, to no one's surprise, that prehistoric Indians preferred to occupy the well drained sandy soils.

Survey tract "A" contains Blaney loamy sand, Bragg sandy loam, Candor sand, Fuquay sand, Johnston loam, and Vaucluse loamy sand (Figure 15). Survey tract "B" contains Blaney loamy sand, Johnston loam, Lakeland-Urban land complex, Udorthents loamy sand. (Figure 16). Survey tract "C" contains Blaney loamy sand, Blaney-Urban land complex, Candor sand, Udorthents loamy sand, Vaucluse loamy sand, and Vaucluse-Gilead loamy sands (Figure15).

Since the effects of erosion and soil deposition characteristics are important in determining site probability, typical soil profiles, as described by Hudson (1984), are briefly discussed below. The occurrence of these soils in the survey tracts are also shown in Figures 14

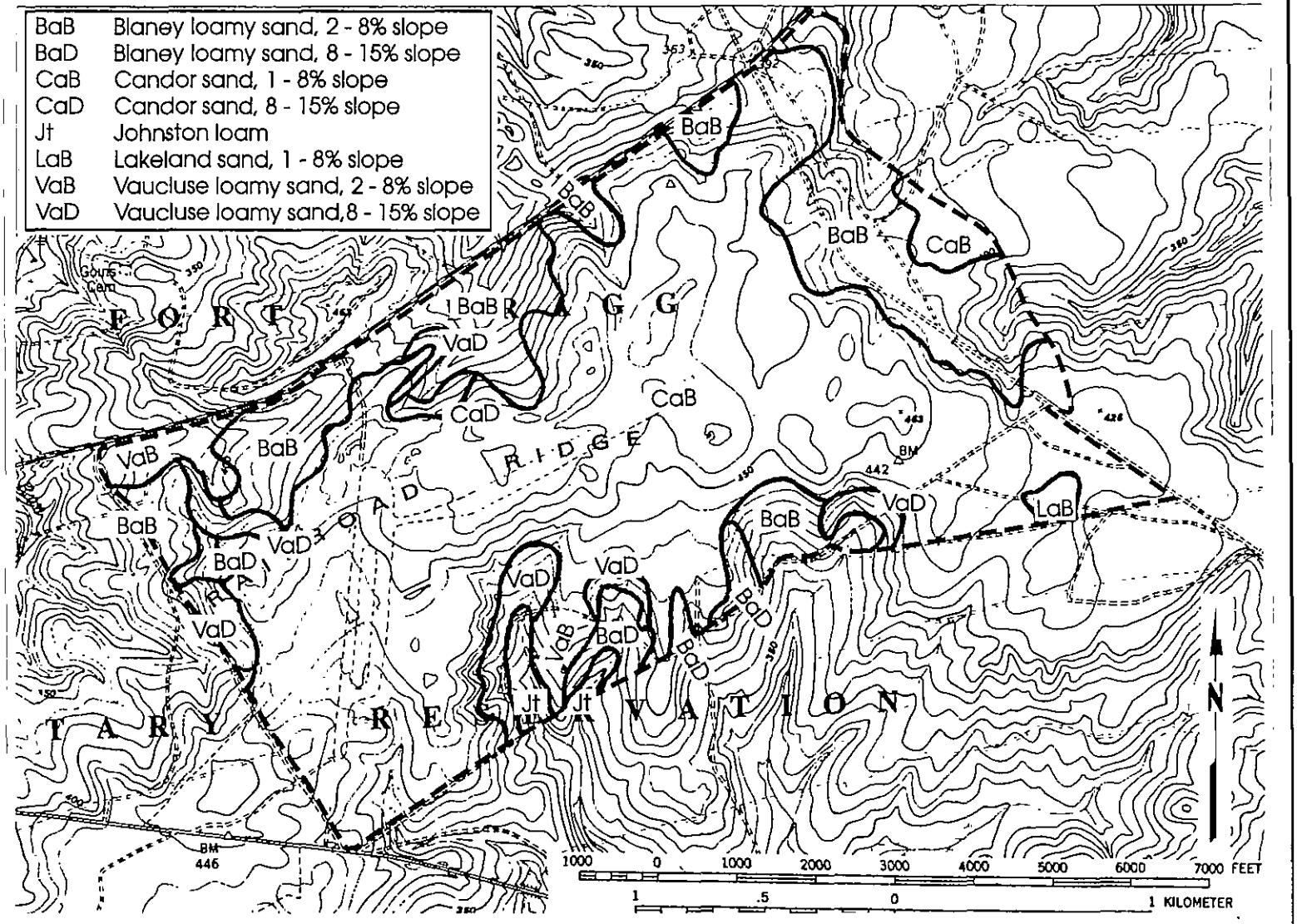

Figure 14. Soils of the Holland Drop Zone survey tract.

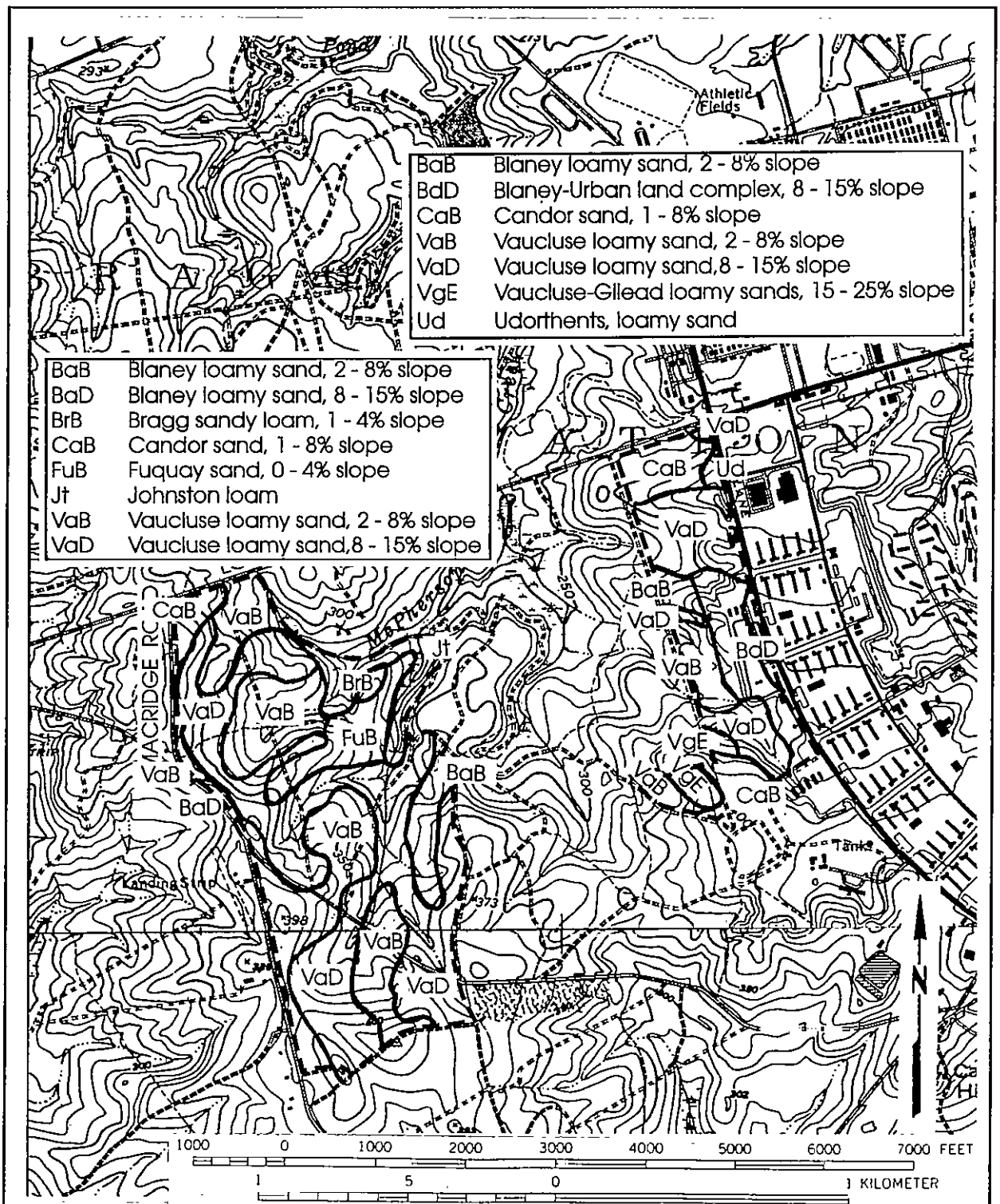

Figure 15. Soils of Fort Bragg general survey tracts "A" and "C".

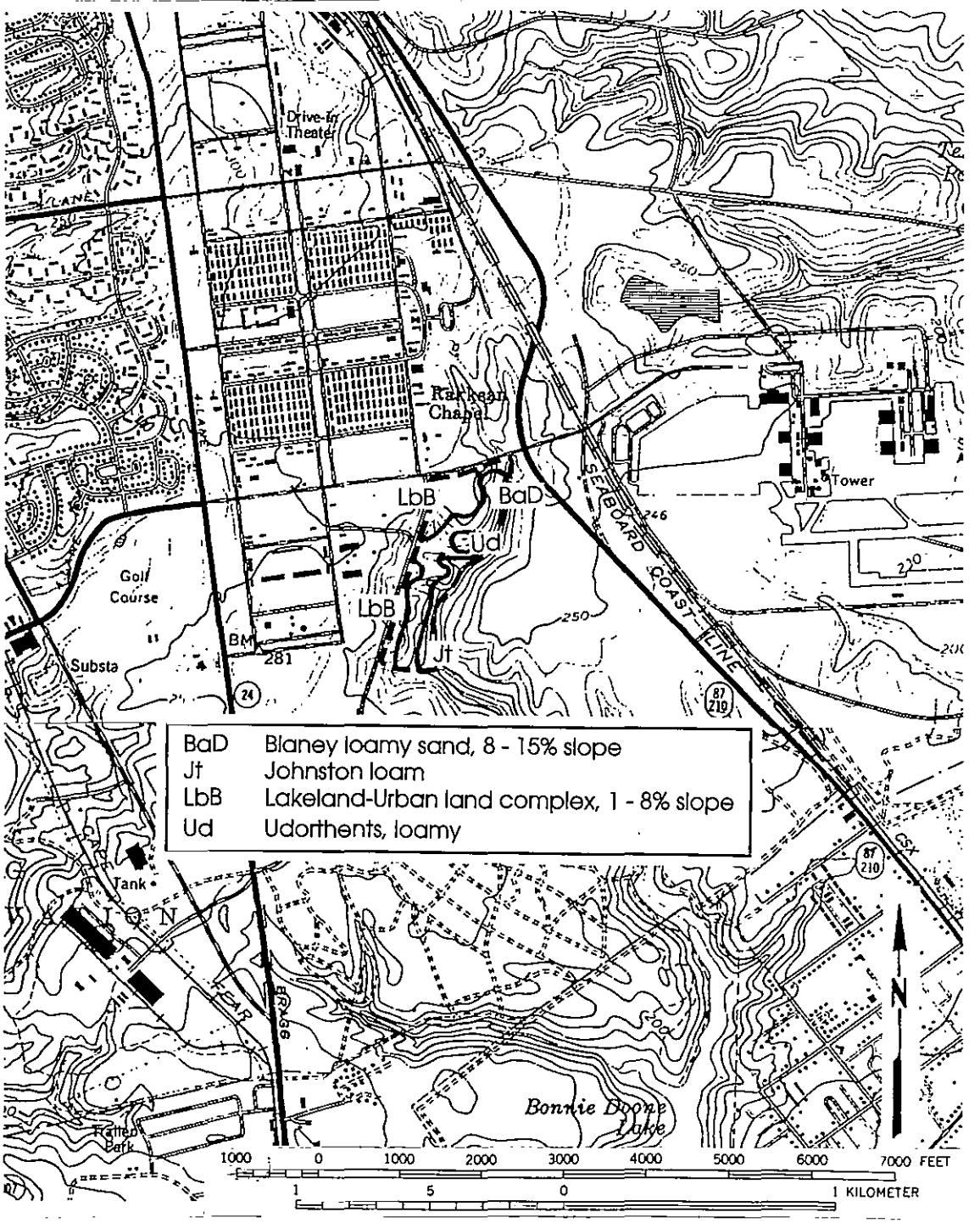

Figure 16. Soils of Fort Bragg general survey tract "B".

through 16.

The **Blaney Series**, characterized by Blaney loamy sand with a 2 to 8% slope, exhibits an A (or often Ap) horizon about 10 cm in depth consisting of dark grayish brown (10YR 4/2) loamy sand. From 10 cm to a depth of 64 cm is an E horizon of light yellowish brown (2.5YR 6/4) loamy sand. The underlying Bt1 horizon, to a depth of 87 cm, is a hard and compact brownish yellow (10YR 6/6) sandy clay loam. Below this, to 1.58 m, is the Bt2 horizon of reddish yellow (7.5YR 6/6) sandy clay loam. The Blaney soils have some of the higher soil erodibility factors present (ranging from .15 to .28).[1]

The **Bragg Series** consists of well drained soils that have a 1 to 4% slope. Bragg soils exhibit a recursive A horizon with multiple C horizons. The Ap horizon, about 15 cm in depth, is a strong brown (7.5YR 5/8) sandy loam. From 15 cm to a depth of 50 cm is a C1 horizon of strong brown (7.5YR 5/8), grayish brown (10YR 5/2), and gray (10YR 6/1) sandy clay loam. The underlying C2 horizon, to a depth of 75 cm, is a reddish yellow (7.5YR 6/8) sandy clay loam with common medium light gray (N 7/0) clay bodies and strata. Below this to 1.0 m, is a C3 horizon of light yellowish brown (10YR 6/4) sandy clay with common medium distinct red (2.5YR 5/8) mottles. The C4 horizon, which extends to 1.22 m below surface, contains a reddish yellow (7.5YR 6/8) sandy clay loam that has common medium distinct light gray (N 7/0) clay bodies. The C5 horizon runs to 1.40 m and contains a yellowish red (5YR 5/6) sandy clay loam with common medium distinct brownish yellow (10YR 6/8) mottles. The C6 horizon extends to 1.80 m and contains light red (2.5YR 6/8) sandy clay with common medium distinct reddish yellow (7.5YR 6/8) mottles. The recursive A horizon occurs between 1.80 and 1.90 m. These soils contain a very dark gray (N 3/0) loamy sand. Below this is an Eb horizon, which runs to a depth of 2.0 m, and consists of a brown (10YR 4/3) loamy sand.

The **Candor Series** are characterized by somewhat excessively drained soils with a slope of 1 to 15%. The Ap horizon is typically a dark grayish brown (10YR 4/2) sand which runs to 23 cm in depth. This is followed by an E horizon, to 50 cm, of a yellowish brown (10YR 5/4) sand. The Bt horizon extends to 75 cm and is a yellowish brown (10YR 5/6) loamy sand. This overlays an E'1 horizon of brownish yellow (10YR 6/6) sand, followed by an E'2 horizon of brownish yellow (10YR 6/6) sand which goes to 1.50 m in depth. The final horizon, a B't horizon of strong brown (7.5YR 5/6) sandy clay loam with many medium and coarse distinct light gray (10YR 7/1) and yellowish red (5YR 5/8) mottles, extends to 2 m in depth.

The **Fuquay Series** contains well drained soils which typically haves slopes which range from 0 to 4%. The A1 horizon is a dark gray (10YR 4/1) sand which extends to a depth of 7.5 cm. This overlies an E horizon of light yellowish brown (2.5Y 6/4) sand which runs to 72.5 cm. The BE horizon, which extends to 1.05 m, is a yellowish brown (10YR 5/6) sandy loam with few medium distinct strong brown (7.5YR 5/6) and red (2.5YR 4/8) mottles. The Bt1 horizon goes to 1.50 m in depth and is a yellowish brown (10YR 5/8) sandy clay loam with common medium distinct strong brown (&.5YR 5/8), gray (10YR 6/1), and red (2.5YR 4/8) mottles. The last horizon of the Fuquay Series is the Bt2 horizon, extending to a depth of 2.0 m and is a mottled strong brown (7.5YR 5/6), gray (10YR 6/1), and red (2.5YR 4/8) sandy clay loam.

The **Johnston Series** contains very poorly drained soils that have slopes which range from 0 to 2%. The A horizon extends to a depth of 1.05

[1] The soil erodibility factor (expressed as K) used in the universal soil loss equation is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. It basically indicates the susceptibility of a soil to water-induced erosion. The soil loss tolerance factor (T), sometimes called the permissible soil loss, is more often used to help quantify wind-induced erosion. This factor is expressed as the maximum rate of soil erosion that will still permit a high level of crop productivity. It is therefore somewhat less useful in these discussions. Regardless, all of the discussed soils in the Fort Bragg project area have the maximum T rating of 5, or 5 tons of soil per acre per year.

m and is a very dark gray (10YR 3/1) loam. This is followed, to 1.3 m, by an ACg horizon of dark grayish brown (10YR 4/2) sandy loam. The Cg horizon extends to 2.0 m and consists of light brownish gray (10YR 6/2) sand.

The **Lakeland Series**, formed in the uplands and consisting of excessively drained soils, will typically have a profile with Ap soils, usually dark gray (10YR 4/1) sand, to 15 cm. Below the Ap soils, to a depth of 38 cm, is the C1 horizon characterized by yellowish brown (10YR 5/6) sand. The C2 horizon, to a depth of 1.12 m, consists of strong brown (7.5YR 5/8) sand.

The **Udorthents Series** is found in areas where soils have been removed. Commonly known as borrow pits, these areas can range in size from 3 to 40+ acres. These pits range in depth from 5 to 20 feet. Hudson (1984:45) states that there are numerous small borrow pits on Fort Bragg. Generally less than 10 acres in size, they are used as source material for roadbeds within the base.

Only two of the present survey tracts, "B" and "C", contain Udorthents soils. Similar in nature to those described by Hudson (1984:45), both were found to contain vegetation, such as pine, as well as an understory of pine and scrub oak. This would tend to indicate a later age for these. Newer borrow pits either contain scattered pockets of water or are completely full of water. The Udorthent soils in tracts "B" and "C" were obviously disturbed and evidenced steep slopes — although such areas were not shovel tested, they were visually surveyed.

The **Vaucluse Series** consists of well drained soils that formed in loamy Coastal Plain sediments with slopes ranging from 2 to 25%. The A horizon, dark brown (10YR 4/3) loamy sand, occurs from 0 to 7.5 cm below the surface. This is followed by the BA horizon of strong brown (7.5YR 5/6) sandy loam that extends to 15 cm. From 15 cm down to 40 cm is the Btx1 horizon, which consists of yellowish red (5YR 5/8) sandy loam. This is followed by the Btx2 horizon, a yellowish red (5YR 5/8) sandy loam with a depth of 75 cm. The Btx3 horizon occurs at a depth of 75 to 110 cm and is a strong brown (7.5YR 5/8) sandy loam mottled with yellow (10YR 7/6).

Typically, the Sand Hills region experiences relatively little erosion. In undisturbed areas 0.012 t of soil loss per ha per year has occurred. Logged areas experience about 0.319 t of soil loss per ha per year. The most destructive erosional situation described by the United States Department of Agriculture (1980:25) are logging roads where erosion consists of 22.46 t of soil loss per ha per year. From logging and logging roads this amounts to approximately 22.779 t of soil loss per ha per year.

Wayne Trimble (1974) studied the effects of man-induced erosion in the southern Piedmont, the Carolina Sand Hills, the southern Coastal Plain, and the Atlantic Coast Flatwoods. His studies concentrated on areas throughout central North Carolina, South Carolina, and Georgia. He determined that in undisturbed areas of the Sand Hills approximately 0.002 t of soil loss per ha per year has occurred (Trimble 1974:25). Logged areas in the Carolina Sandhills experience .053 t of soil loss per ha per year (Trimble 1974:25). Logging roads experience 3.67 t of soil loss per ha per year and that associated skid trails suffered 2.203 t of soil loss per ha per year. According to Trimble (1974:25) total erosion from logging operations and associated skid trails and logging roads contributes to a total of 5.93 t of soil loss per ha per year within the Carolina Sandhills.

Heavy erosion has been observed in previous studies conducted at the Sicily Drop Zone (Trinkley et al. 1996a), and the Camp Mackall Drop Zone (Trinkley et al. 1996b), where clear cutting has occurred. This same type of erosional process has been observed in the current study. The monitoring of the sites investigated during this study may, over time, determine the short term affect of these types of clear cutting procedures on soil erosion, as well as the extant archaeological resources.

Climate

North Carolina is part of the warm temperate zone, characterized by what might be called a placid climate, with local variations due

partially to the tremendous range in elevation from the mountains to the coast. Centrally located Hoke County is generally hot and humid in the summer because of the moist, maritime air. The winters are moderately cold but short since the mountains to the west protect the area from many cold waves. The average winter temperature in nearby Fayetteville is 6°C. In the summer the average daily temperature is 26°C in Fayetteville. In general, spring comes earlier to the Sand Hills than to the adjacent Piedmont since the loose, well-drained soils can warm more rapidly. This benefit, however, is coupled with the general dryness of the soils. The total annual precipitation is 1.07 m. Of this, 60% usually falls in April through September, which includes the growing season for most crops (Hudson 1984:2; see also Reed 1936).

During the late Pleistocene and early Holocene periods temperatures were considerably cooler than they are today. Temperatures began to moderate and approach modern temperatures around 7,000 B.P. along the Southeast Atlantic Slope (Wright 1976:594). A more thorough discussion is provided below relating vegetational change to these climatic ranges.

Floristics and Paleoenvironment

The Sandhills Province is dominated by longleaf pine and various xeric oaks such as post oak, Margaret's oak, bluejack oak, and turkey oak. In addition, much of the overstory vegetation includes sweetgum, beech, southern red oak, mockernut hickory, and southern sugar maple (Barry 1980:139-140; Gade and Stillwell 1986). This, in general, adequately characterizes the vegetation of Camp Mackall and Fort Bragg. Loftfield observed that the vast majority of the post consisted of "droughty sandy upland habitat longleaf pine (*Pinus palustris*), turkey oak (*Quercus laevis*), with a ground cover of wire grass (*Gaylussacia dumosa*)" which was being kept in balance by periodic controlled burns (Loftfield 1979:9).

In the 1860s only about 10% of what would later become Hoke County was improved for cultivation (Hilliard 1984:Map 44), while by the 1940s about 25% of the county was cropped with around 70% being forested (Cruikshank 1944:11-12). Only about 7% of Fort Bragg, however, was being cultivated prior to its purchase by the military in the second decade of the twentieth century. Cotton and corn were historically produced on the bottomlands, while the rolling sandy uplands were dominated by smaller farms producing grains and fruits. The area, before the Civil War, was the site of experiments in the production of tea (State Board of Agriculture 1896:327).

Pollen cores obtained from the Southeastern Coastal Plain indicate a sequence of successional forest types from the Full Glacial through the Post Glacial periods (Watts 1971; Whitehead 1965). Prior to strong evidence of human population (pre-15,000 B.P.), cold-adapted vegetation, predominately spruce and jack pine, was found in the Piedmont and Coastal Plain area. Other less common species included oak and ironwood. All of these species suggest a much colder and drier environment than found today (Watts 1980:326). Some have suggested that this climate was much like today's eastern Canadian boreal forests, dominated by pine and spruce distributed in a mosaic pattern of stands within sedge-dominated prairies. There is evidence for parabolic dune formations during the Full Glacial period as derived from sediments from the Pee Dee River. These dune fields are also present north of the Cape Fear. This arid phase is also evidenced in the pollen record of Singletary Lake where there is an increase in the sand fraction during this period (Whitehead 1973; Claggett and Cable 1982).

The somewhat warmer and moister environment evidenced in the Late Glacial (15,000 to 10,000 B.P.) is associated with an increase in deciduous species. Northern hardwoods, such as oak, hickory, beech, birch, and elm began replacing the spruce and jack pine populations. This change corresponds with warmer summer temperatures and colder winter temperatures, as well as an increase in precipitation. It is during this period that the first moderately well documented evidence for human occupation occurs (Watts 1980; Sassaman et al. 1990:21). This period was also a transitional period between the glacial Late

Pleistocene and the essentially modern climatic conditions of the Holocene. The resulting mesic forest, with its relatively high percentages of beech and hickory, has no modern analog and was the result of the cool, moist conditions which characterized this transition.

During the Post Glacial (10,000 B.P. to present) oak and hickory dominated the region. Other species such as walnut, hemlock, and hazelnut disappeared from the pollen record. By 9,500 B.P. hickory and ironwood species declined and were replaced by sweetgum and blackgum. These changes prior to 7,000 B.P. suggest periods of rapid warming and increased moisture (Watts 1980; Watts and Stuiver 1980). It has been observed that these very rapid environmental changes would have created a dynamic ecosystem requiring constant adaptive adjustments on the part of early groups (Cable and Mueller 1980:7).

In the Sandhills region southern pine communities displaced the oak-dominated forests between 8,000 and 6,000 B.P. which led to a decrease in nut mast production (Sassaman et al. 1990:22). This vegetational change probably had an effect on prehistoric land use during certain times of the year, since nut masts were probably more isolated and concentrated rather than widespread. Coupled with these vegetational changes was a cooler, moister climate (Watts 1971 and 1980).

Brooks et al. (1986) suggest that not only latitude, but also elevation affected when vegetational changes occurred. As a result, broad environmental changes probably occurred first in the Coastal Plain.

From about 5,000 B.P. and continuing to the present, Whitehead (1973) found pine increasing slightly, although oak appeared to remain dominant in natural forest stands. The precontact environment of the Piedmont Southeastern United States was termed "temperate deciduous forest" by Shelford (1974:56-88) with oak and hickory interspersed with pine, maple, ash, and other deciduous species (for a graphic representation see Shantz and Zon 1936). Küchler (1964) identifies the "potential natural vegetation" of the Fort Bragg area as that of the Southern Mixed Forest, surrounded by the more common Oak-Hickory-Pine Forest. Küchler's forests represent what would "exist today if man were removed from the scene and if the resulting plant succession were telescoped into a single moment" (Küchler 1964:2). The result for the project area would be tall forests of broadleaf deciduous and evergreen and needleleaf evergreen trees. The dominants would include beech, sweet gum, southern magnolia, slash pine, loblolly pine, white oak, and laurel oak. Hickories would occur as minor components, along with dogwood and hollies.

By the historic period the Sandhills were dominated by loblolly pine. Although the name means, literally, "mud puddle," and was likely applied since the tree grew on wet soils, the loblolly is also known as the "bull pine" because of its prodigious size and remarkable ability to invade dry, flat terrain and even the hilly uplands. The pines formed vast, open forests interrupted only by the occasional inland swamp and its accompanying hardwoods.

The Sandhills, their soil, and their vegetation frequently attracted the attention of observant commentators. One, Edmund Ruffin, remarked in 1843 that:

> the land hereabouts is barren, or but triflingly productive. The middle grounds between the rivers are the highest, and consequently the most barren . . . Their soil is of so sterile a nature that in many places it produces no grass to cover it; and the tracks of any animal passing over it, are discernable, as if they had been upon snow. The low grounds among these hills are either extensive swamps and bays, or narrow valleys, into which, the mould from the adjacent high lands have been deposited by the rains which run down their sides. Hence they become suitable for agriculture and pasturage, and are principally those places, near

> which settlements are effected (Mathew 1992:4).

On another occasion Ruffin commented:

> the soil is of deep sand & very poor. The growth pine intermixed with small scrub & other oaks. . . the country seems as desolate as possible. Not a creature was seen, nor any mark of man's neighborhood, save the deep sandy track in which I was riding (Mathew 1992:262).

European occupation of the countryside, including occupation of the Sandhills, gradually changed its appearance. The pines which dominated the topography, for example, began to give way to scrubby hardwoods by the early 1800s (Silver 1990:187). It is almost certain that the process was largely completed by the time that Ruffin traveled across the region in the mid-1800s. Yet there were other, equally momentous changes. Turkeys and other wild fowl were less common, the flocks of Carolina parakeets and passenger pigeons were on the verge of extinction. Buffaloes were already gone from the neighboring Piedmont. In the lowland swamps the beavers, otters, and minks were close to gone, as were other occasional visitors such as bears, wolves, panthers, and bobcats.

The countryside was becoming increasingly dominated by small farms. The new ecology, created by clearing and farming grains, encouraged flocks of quail. While the minks and otters gave way to hunting pressures, they were quickly replaced by the opossum. But into the nineteenth century the most common animals were the cattle, hogs, and sheep brought by the Sandhills settlers. Silver notes that, "fewer canebrakes and overgrazed mixed hardwood forests attest to the forage habits of these Old World Beasts" (Silver 1990:187-188). The changes were dramatic, gradually giving rise to the Sandhills we know today.

PREHISTORIC AND HISTORIC OVERVIEW

Previous Research

Some of the earliest archaeology within south central North Carolina includes the 1860 excavations by Hamilton MacMillan of a mound southwest of Fayetteville, near Rockfish Creek (Holmes 1916). The mound, about 0.5 m high and 6 m in diameter, contained a large number of skeletons, reputed to have represented as many as 50 individuals. Although Holmes offered no temporal estimate for this and similar mounds in the vicinity, he did note that, "they are quite different from those mounds of Caswell and other counties of the western section of the state, and of much less interest so far as contents are concerned" (Holmes 1916:19). This was one of the earliest accounts of the differences between the "treasures" found in Mississippian temple mounds and the dearth of remains which characterized Middle Woodland burial mounds.

Nearly 30 years later, Charles Peabody visited Cumberland County on vacation with his daughter. During this respite he excavated four mounds near Hope Mills (Peabody 1910:429; Coe 1983:165). His findings paralleled the earlier studies of Holmes. Found were human bones, smoking pipes, a celt, a shell gorget, and similar Middle Woodland artifacts. Peabody's work also revealed the relatively strong local interest in the past. Peabody's contact, Dr. J.W. McNeil, was a participant on another archaeological excursion which "explored" a mound south of Little Rockfish Creek about 24 km southwest of Fayetteville (Oates 1972:328-329).

The next archaeological activity in the Fayetteville area was probably the work of Howard MacCord, who war stationed at Fort Bragg in the early 1960s. Intrigued by the mounds in the area he excavated one of them, the McLean Mound on the east side of the Cape Fear River (MacCord 1966). The mound, which was apparently as high as 1.8 m in the 1920s had eroded down to just over a half meter by the time of the study. Perhaps MacCord's most significant contribution was keeping alive the interest in burial mound studies (see Coe et al. 1982; Phelps 1983; Wetmore 1978; Wilson 1982).

Previous archaeological work at Fort Bragg includes Loftfield (1979), McCullough (1985), Jameson (1986a, 1986b), Braley (1988, 1990), Braley and Schuldenrein (1993), King et al. (1992), and Abbott (1994, 1995).

Loftfield's (1979) study consisted of a reconnaissance level survey of about 6,690 ha which consisted of a 15% sample of the entire Fort Bragg property. He recorded 490 archaeological sites of which nine (or 2%) occurred within the boundaries of the Holland Drop Zone survey tract (Figure 17). None of Loftfield's sites were found within survey tracts "A", "B", or "C". Loftfield found that prehistoric sites were most often located on hilltops, toe slopes, upland flats, and saddles. Usually they occurred in association with rank 1 streams or springs and were found on sandy soils. Typically the sites were located on a northern, northeastern, or eastern slope face. He predicted that at Fort Bragg the average site density would be 10 sites per km^2.

During Braley's (1988) work at the Northern Training Area, he tested Loftfield's model for site location and found it to be useful (see also Braley 1990:22). However, Braley (1988) recorded many more sites (15.8 sites per km^2) than predicted by Loftfield's model. Of course, Loftfield's predictions were based on a reconnaissance level study where primarily fire break roads and drop zones were surveyed, whereas Braley's (1988) work consisted of an intensive survey of a 15% random sample. He found that site density was slightly higher in lowland settings (1990:23). Both Loftfield's and Braley's models focussed on prehistoric resources. None of Braley's (1990) sites were found within

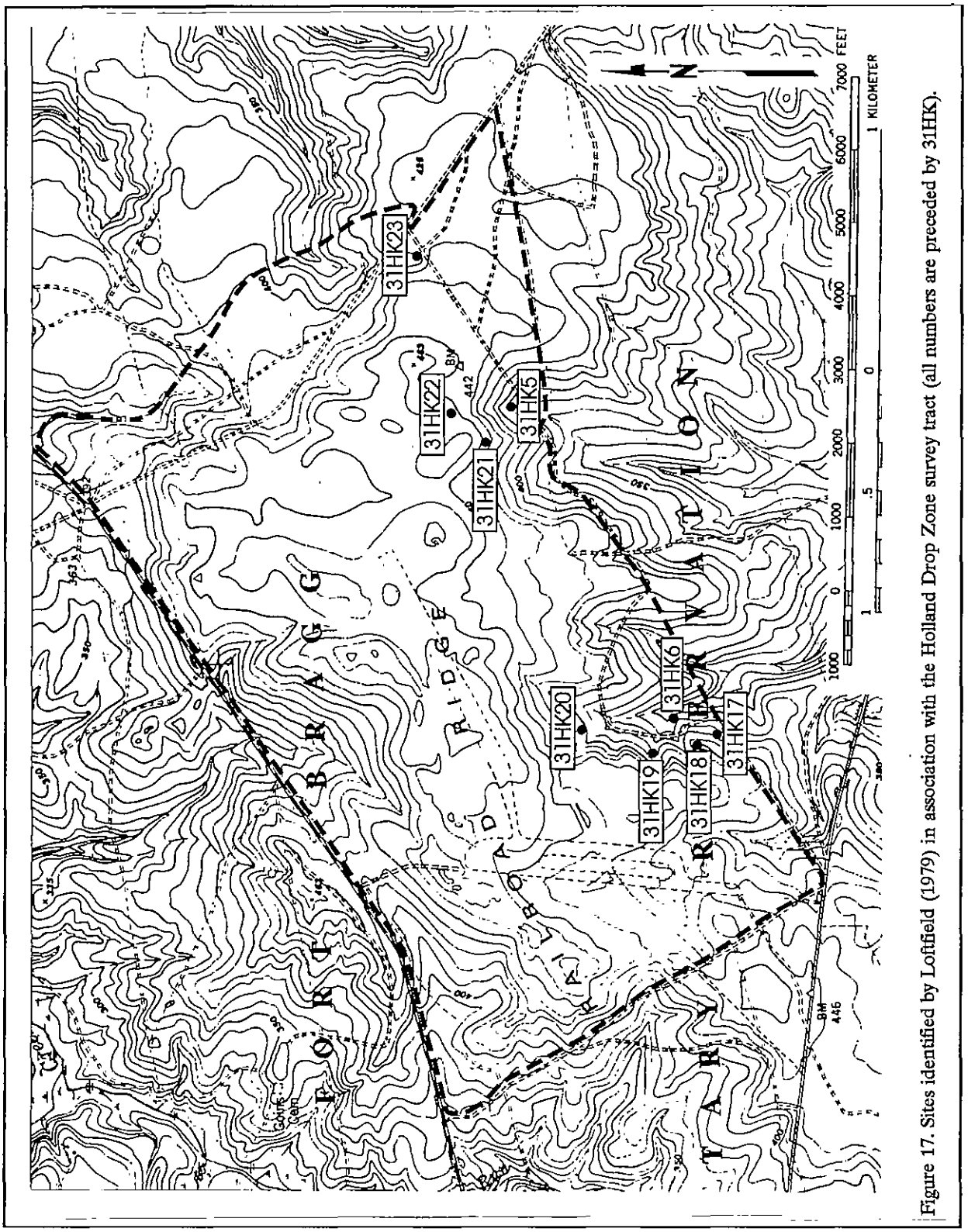

Figure 17. Sites identified by Loftfield (1979) in association with the Holland Drop Zone survey tract (all numbers are preceded by 31HK).

any of the Fort Bragg general survey tracts although a number were situated just outside of the survey boundaries of survey tracts "A" and "C" Figure 18).

A notable early attempt to establish prehistoric settlement patterns was undertaken in 1980 using National Park Service Survey and Planning grant funds to explore Sampson County, situated east of and adjacent to Cumberland (Hackbarth and Fournier-Hackbarth 1981). This study identified 196 sites, and environmental and locational attributes for a random sample were examined in the hope of establishing predictive models. The results, however, were rather mixed. Most sites were found (not unexpectedly) near water sources. There was also a correlation between some loamy sands and sands and sites in general (Hackbarth and Fournier-Hackbarth 1981:78), although there seemed to be no preference by temporal period. Attempts to determine preferences for different lithic materials by time period were also largely unsuccessful (Hackbarth and Fournier-Hackbarth 1981:78).

In 1986 Kenneth Robinson conducted a series of reconnaissance level studies for the Cumberland County Commissioners and Administrators as part of a NPS Survey and Planning Grant. His findings document the exceptional diversity of prehistoric and historic resources in Cumberland County, although given the nature of the study no clear statements could be made concerning either site densities or predictive models (Robinson 1986:44).

In neighboring Moore County, King et al. (1992) also found that there was a preference for lowland settings. However, the sites in the uplands were larger, a departure from Braley's (1990) expectations that larger sites would be found in the lowlands. King et al. (1992:125) concluded that upland sites were occupied for longer periods of time and perhaps by more people at any given time. Site density here was similar to that found by Braley (1990) (15.2 site per km^2).

Although there has been a great deal of survey information gathered from the Sandhills region, there have been few excavations. Some limited excavations were conducted at a prehistoric site identified during the survey of the Rockfish Creek Wastewater Sewage Treatment Facility in southern Cumberland County. McLean and Sellon (1979) note that the site was a "mixture of Woodland and Archaic artifacts" overlying a "sparsely occupied zone of Archaic lithic material with no diagnostic artifacts" about 40 cm below the surface (McLean and Sellon 1979:65). The modest assemblage included Archaic projectile points and several hundred sherds. As Robinson (1986:42) points out, "there is still a need for re-evaluation and synthesis of the material" and little more can be said about this study.

Sassaman et al. (1990) have excavated a number of sites at the Department of Energy's Savannah River Site in the Sandhills of South Carolina. Sassaman et al. (1990) excavated several Woodland Period sites which are interpreted to have functioned as residential bases. These sites are characterized by rock clusters (which are assumed to be hearths or food preparation areas), discrete clusters of lithic debitage, and household areas which contain few artifacts.

While further removed, it seems almost inconceivable not to mention at least a few sites on which much of North Carolina's prehistoric chronology is based. About 65 km from Fort Bragg to the northwest is the Town Creek mound and village site. Described by Loftfield (1979:12) as the "great center of Pee Dee culture," it might better be viewed, at least culturally, as a small mound in a big pond. Regardless, work there has defined the Pee Dee culture, ceramics, and people (Coe 1983, 1995; Ferguson 1971; Reid 1967). About 80 km to the northwest are the equally important sites of Hardaway and Doerschuk (along with the less well reported sites at Morrow Mountain and Lowders Ferry) (Coe 1949, 1964).

Historic resources have tended to take a "back-seat" to prehistoric sites in the research conducted in the general vicinity of Fort Bragg. During surveys for the Rockfish Creek Wastewater Sewage Treatment Facility, Robinson mentions that the location of "Folly Fort," a Confederate Civil War fortification built to defend the Cape Fear River, was identified (Robinson 1986:52).

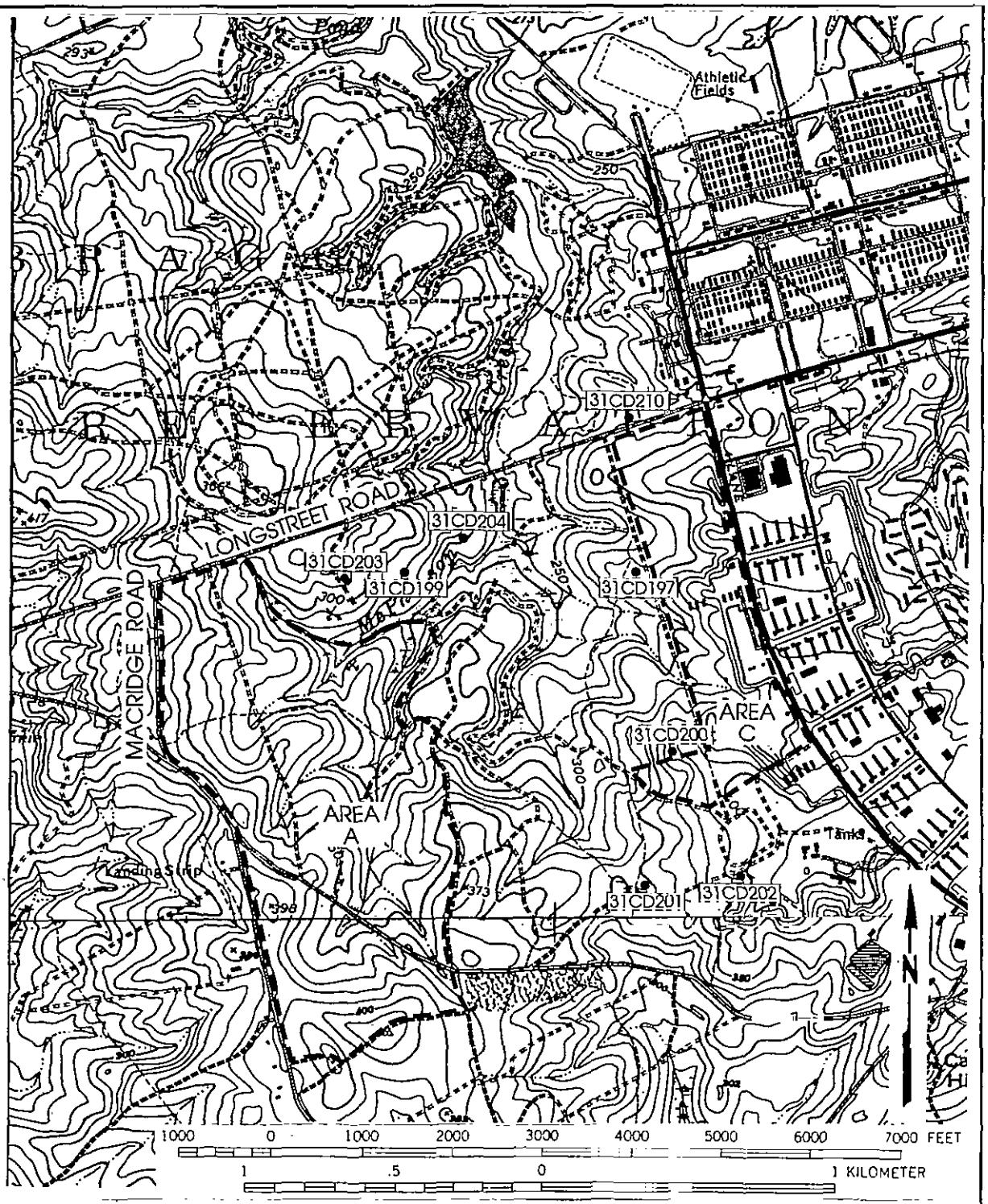

Figure 18. Sites identified by Braley (1990) in association with Fort Bragg general survey tracts "A" and "C" (all numbers are preceded by 31CU).

Otherwise, historical archaeology has tended to focus on urban research in Fayetteville (for a synopsis see Robinson 1986:46-48).

Turning to South Carolina, Brooks and Crass (1991) have published a predictive model for historic resources on the Savannah River Site based on survey and archival data. While early pioneers settled on the Savannah River, by the late eighteenth century, settlements had progressed up the larger drainages. A similar situation appears to have occurred in the Cape Fear River Valley (see Meyer 1961: Maps V-VIII; Loftfield 1979).[1] As better road systems developed in the nineteenth century, settlement became more road oriented (Brooks and Crass 1991:78-79). However, Abbott et al. (1995:23) point out that because the Sandhills soils were poor for growing crops, particularly in the uplands settlers were deterred from living in this area. It is likely that only lands bounded by creeks or rivers were found to be suitable for agriculture. A similar observation was made for neighboring South Carolina by Edmund Ruffin in the late antebellum (Mathew 1992). This suggests that historic settlement patterning may have changed very little through the Sandhills history.

Prehistoric Overview

Overviews for North Carolina's prehistory, while of differing lengths and complexity, are available in virtually every compliance report prepared. There are, in addition, some "classic" sources well worth attention, such as Joffre Coe's *Formative Cultures* (Coe 1964), as well as some newer general overviews (such as Phelps 1983 and Ward 1983). These can be supplemented with a broad range of theses and dissertations produced by students of North Carolina's colleges and universities. Also extremely helpful, perhaps even essential, are a handful of recent local synthetic statements, such as that offered by Sassaman and Anderson (1994; see also the recently revised version Anderson and Sassaman 1996) for the Middle and Late Archaic. Only a few of the many sources are included in this study, but they should be adequate to give the reader a "feel" for the area and help establish a context for the various sites identified in the study areas. For those desiring a more general synthesis, perhaps the most readable and well balanced is that offered by Judith Bense (1994), *Archaeology of the Southeastern United States: Paleoindian to World War I.* Figure 19 offers a generalized view of North Carolina's cultural periods.

Paleoindian Period

The Paleoindian Period, most commonly dated from about 12,000 to 10,000 B.P., is evidenced by basally thinned, side-notched projectile points; fluted, lanceolate projectile points; side scrapers; end scrapers; and drills (Coe 1964; Michie 1977; Williams 1968). Oliver (1981, 1985) has proposed to extend the Paleoindian dating in the North Carolina Piedmont to perhaps as early as 14,000 B.P., incorporating the Hardaway Side-Notched and Palmer Corner-Notched types, usually accepted as Early Archaic, as representatives of the terminal phase. This view, verbally suggested by Coe for a number of years, has considerable technological appeal.[2] Oliver suggests a continuity from the Hardaway Blade through the Hardaway-Dalton to the Hardaway Side-Notched, eventually to the Palmer Side-

[1] In Cumberland County there is good evidence that occupation spread up creeks, especially Rockfish Creek, with numerous small villages established on the banks of Cross Creek and even further upstream along the Cape Fear. One historic village which documents this settlement pattern is Cross Creek. Situated 1.6 km west of the Cape Fear River, on the banks of Cross Creek, the village was the terminus for river traffic and the point of origin for roads being built into the interior. By 1770 it contained about a hundred structures, including grist mills, a tannery, a brewery, and a sawmill.

[2] While never discussed by Coe at length, he did observe that many of the Hardaway points, especially from the lowest contexts, had facial fluting or thinning which, "in cases where the side-notches or basal portions were missing, . . . could be mistaken for fluted points of the Paleo-Indian period" (Coe 1964:64). While not an especially strong statement, it does reveal the formation of the concept. Further insight is offered by Ward's (1983:63) all too brief comments on the more recent investigations at the Hardaway site (see also Daniel 1992).

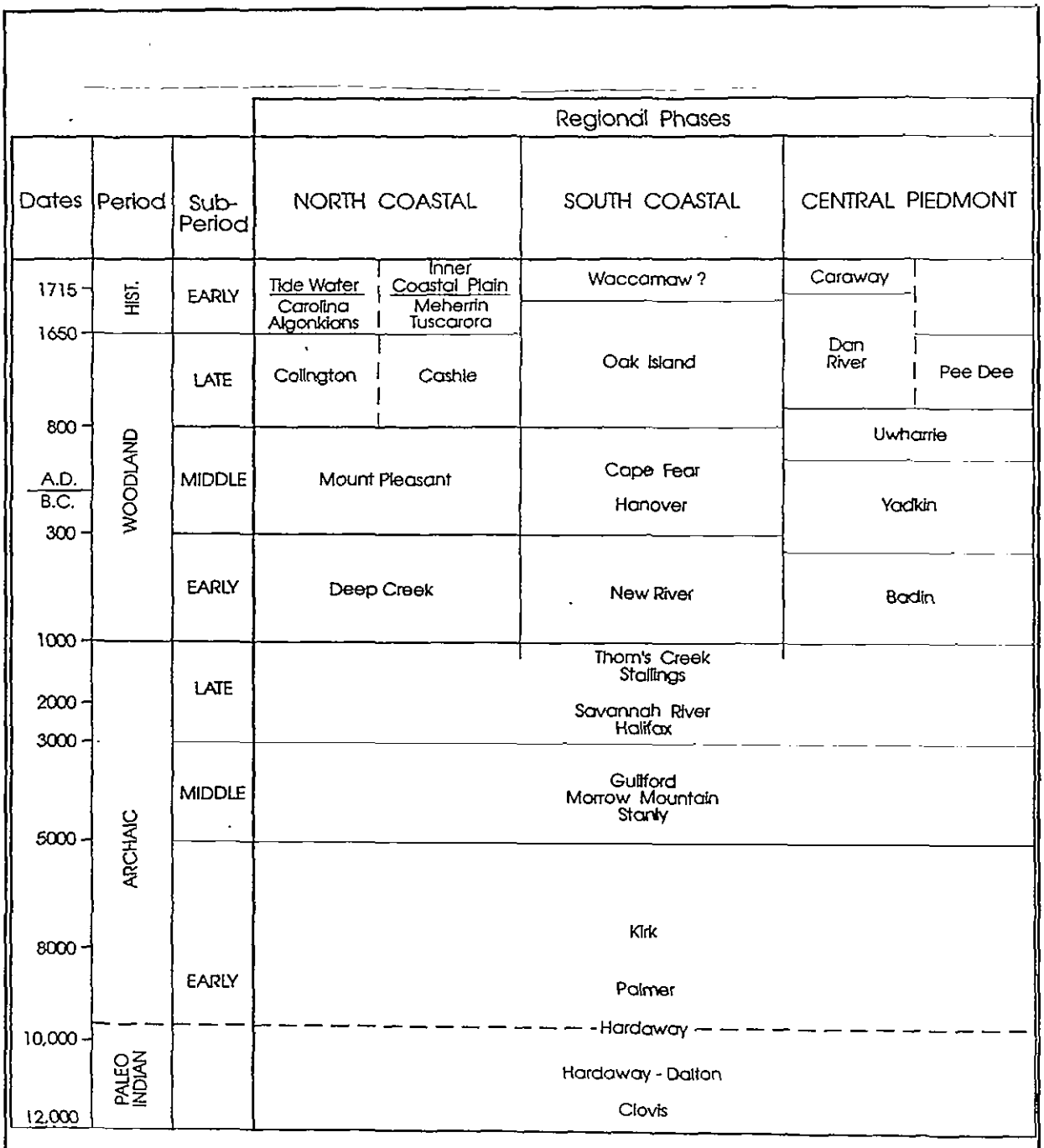

Figure 19. A generalized cultural sequence for eastern North Carolina (partially adapted from Coe 1964:Figure 116 and Phelps 1983:Figue 1.2).

Notched (Oliver 1985:199-200). While convincingly argued, this approach is not universally accepted.

The Paleoindian occupation, while widespread, does not appear to have been intensive. Artifacts are most frequently found along major river drainages, which Michie interprets to support the concept of an economy "oriented toward the exploitation of now extinct mega-fauna" (Michie 1977:124). Survey data for Paleoindian tools, most notably fluted points, is rather dated for North Carolina (Brennan 1982; Peck 1988; Perkinson 1971, 1973; cf. Anderson 1990b). In spite of this, the distribution offered by Anderson (1992:Figure 5.1) reveals a rather general, and widespread, occurrence throughout the region. Phelps (1983:21) states that settlement patterning in the North Carolina Coastal Plain is impossible to meaningfully discuss since there have been so few recorded sites, but speculates on the presence of base camps along major streams, with special activity sites in the uplands. An alternative is the model tracking the replacement of a high technology forager (or HTF) adaptation by a "progressively more generalized band/microband foraging adaption" accompanied by increasingly distinct regional traditions (perhaps reflecting movement either along or perhaps even between river drainages) (Anderson 1992b:46).

Distinctive projectile points may include lanceolates such as Clovis, Dalton and perhaps the Hardaway (Coe 1964; Phelps 1983; Oliver 1985) (Figure 20). A temporal sequence of Paleoindian projectile points was proposed by Williams (1965:24-51), but according to Phelps (1983:18) there is little stratigraphic or chronometric evidence for it. While this is certainly true, a number of authors, such as Anderson (1992a) and Oliver (1985) have assembled impressive data sets. We are inclined to believe that while often not conclusively proven by stratigraphic excavations (and such proof may be an unreasonable expectation), there is a large body of circumstantial evidence. The weight of this evidence tends to provide considerable support.

Unfortunately, relatively little is known about Paleoindian subsistence strategies, settlement systems, or social organization (see, however, Anderson 1992b for an excellent overview and synthesis of what is known). Generally, archaeologists agree that the Paleoindian groups were at a band level of society (see Service 1966), were nomadic, and were both hunters and foragers. While population density, based on isolated finds, is thought to have been low, Walthall suggests that toward the end of the period, "there was an increase in population density and in territoriality and that a number of new resource areas were beginning to be exploited" (Walthall 1980:30).

According to Braley (1990:5) there are a modest number of late Paleoindian sites on Fort Bragg. Of the 196 sites that Loftfield (1979) found which produced diagnostic points, only 26 contained Hardaway, Palmer, or Big Sandy artifacts. Abbott et al. (1995:8) also identified several Paleoindian points from contexts in the near vicinity of Fort Bragg.

Archaic Period

The Archaic Period, which dates from 10,000 to 3,000 B.P.[3], does not form a sharp break

[3] The terminal point for the Archaic is no clearer than that for the Paleoindian and many researchers suggest a terminal date of 4,000 B.P. rather than 3,000 B.P. There is also the question of whether ceramics, such as the fiber-tempered Stallings ware, will be included as Archaic, or will be included with the Woodland. Oliver, for example, argues that the inclusion of ceramics with Late Archaic attributes "complicates and confuses classification and interpretation needlessly" (Oliver 1981:20). He comments that according to the original definition of the Archaic, it "represents a preceramic horizon" and that "the presence of ceramics provides a convenient marker for separation of the Archaic and Woodland periods (Oliver 1981:21). Others would counter that such an approach ignores cultural continuity and forces an artificial, and perhaps unrealistic, separation. Sassaman and Anderson (1994:38-44), for example, include Stallings and Thom's Creek wares in their discussion of "Late Archaic Pottery." While this issue has been of considerable importance along the Carolina and Georgia coasts, it has never affected the Piedmont, which seems to have embraced pottery far later, well into the conventional Woodland period. The importance of the issue in the Sandhills, unfortunately, is not well known.

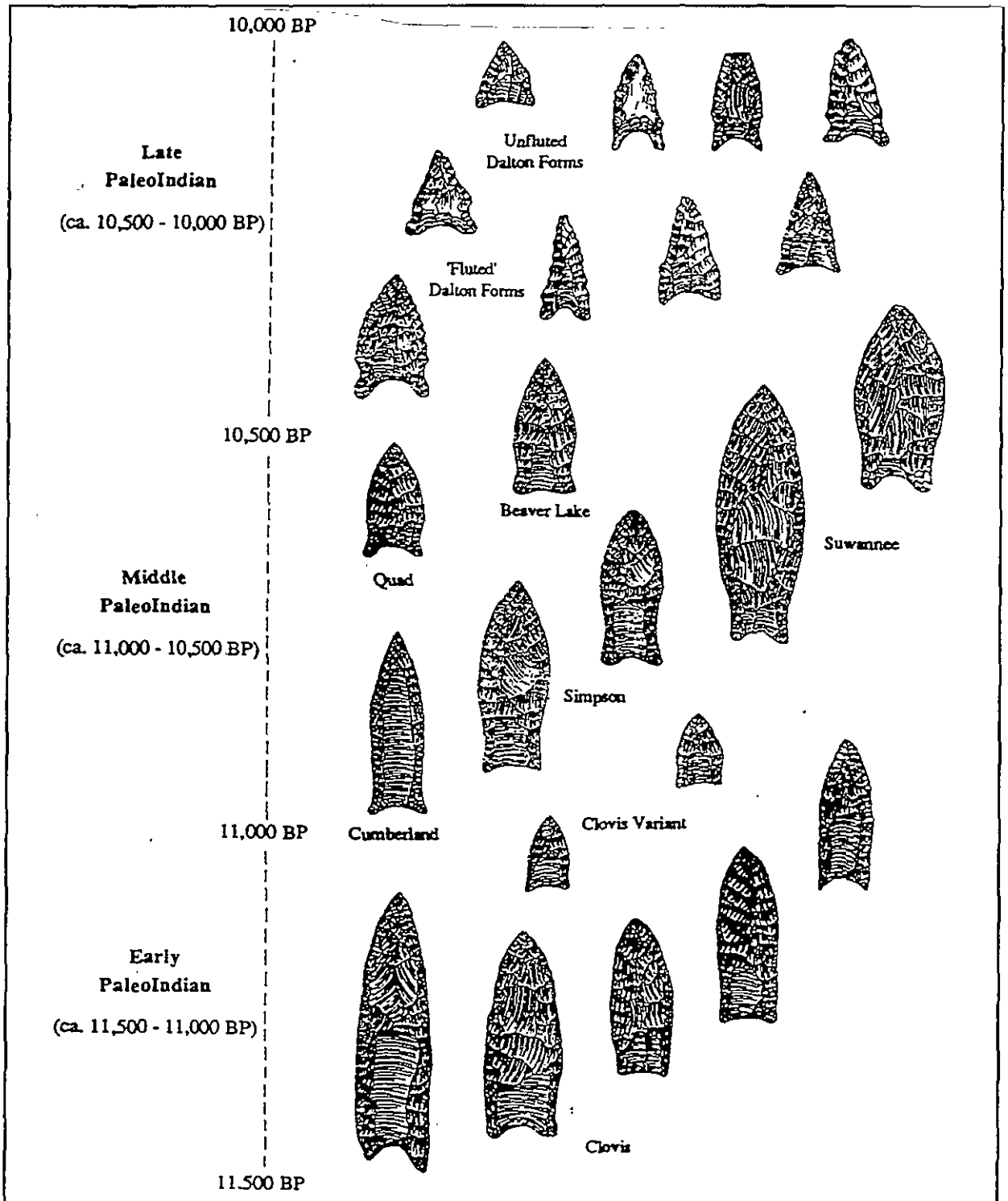

Figure 20. Diagnostic Paleoindian projectile points and suggested chronology for Georgia and the Carolinas (adapted from Anderson 1992a:Figure 3.1).

with the Paleoindian Period, but is a slow transition characterized by a modern climate and an increase in the diversity of material culture. Associated with this is a reliance on a broad spectrum of small mammals, although the white tailed deer was likely the most commonly exploited animal. Archaic period assemblages, exemplified by corner-notched and broad-stemmed projectile points (Figure 21), are fairly common, perhaps because the swamps and drainages offered especially attractive ecotones.

Loftfield's (1979:54) data suggests that there was a noticeable population increase from the Paleoindian (with five identified components in his study) into the Early Archaic (where at least 42 components were isolated). This corresponds with findings by other researchers (see, for example, Ward 1983:65). This has tentatively been associated with a greater emphasis on foraging. Diagnostic Early Archaic artifacts include the Kirk Corner Notched point. As previously discussed, Palmer points may be included with either the Paleoindian or Archaic period, depending on theoretical perspective. As the climate became hotter and drier than the previous Paleoindian period, resulting in vegetational changes, it also affected settlement patterning as evidenced by a long-term Kirk phase midden deposit at the Hardaway site (Coe 1964:60). This is believed to have been the result of a change in subsistence strategies.

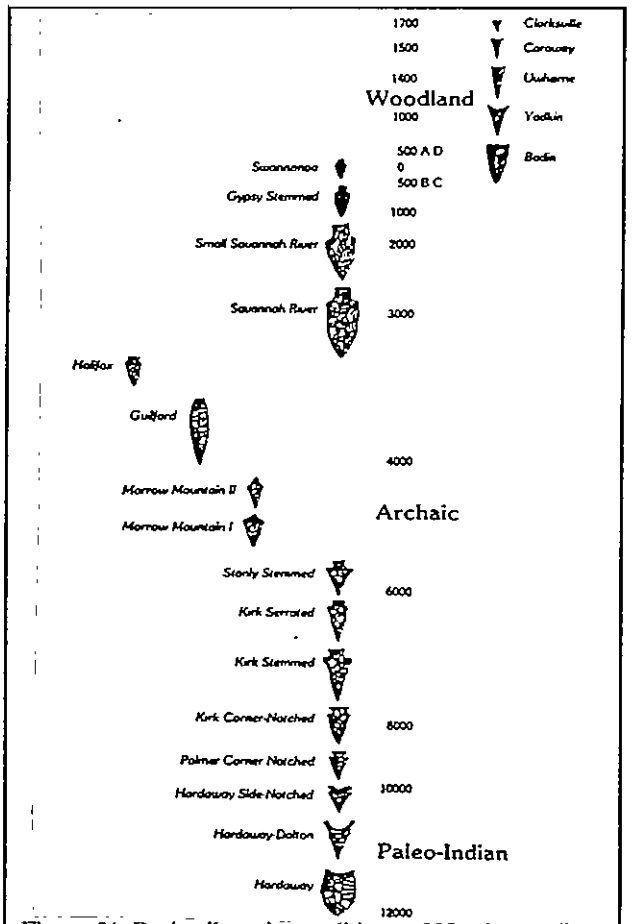

Figure 21. Projectile point traditions of North Carolina (adapted from Oliver 1985:Figure 10-8)

Settlements during the Early Archaic suggest the presence of a few very large, and apparently intensively occupied, sites which can best be considered base camps. Hardaway might be one such site. In addition, there were numerous small sites which produce only a few artifacts — these are the "network of tracks" mentioned by Ward (1983:65). The base camps produce a wide range of artifact types and raw materials which has suggested to many researchers long-term, perhaps seasonal or multi-seasonal, occupation. In contrast, the smaller sites are thought of as special purpose or foraging sites (see Ward 1983:67).

Middle Archaic (8,000 to 6,000 B.P.) diagnostic artifacts include Morrow Mountain, Guilford, Stanly and Halifax projectile points. Middle Archaic diagnostic artifacts were found to occur on 60 of the 196 sites found by Loftfield (1979; see also Braley 1990:7). Phelps (1983:25) also notes that the gradual increase from Paleoindian to Archaic in the Coastal Plain seems to peak during the Middle Archaic Morrow Mountain phase.

Much of our best information on the Middle Archaic comes from sites investigated west of the Appalachian Mountains, such as the work by Jeff Chapman and his students in the Little Tennessee River Valley (for a general overview see Chapman 1977, 1985a, 1985b). There is good evidence that Middle Archaic lithic technologies changed dramatically. End scrapers, at times associated with Paleoindian traditions, are discontinued, raw materials tend to reflect the

greater use of locally available materials, and mortars are initially introduced. Associated with these technological changes there seem to also be some significant cultural modifications. Prepared burials begin to more commonly occur and storage pits are identified. The work at Middle Archaic river valley sites, with their evidence of a diverse floral and faunal subsistence base, seems to stand in stark contrast to Caldwell's Middle Archaic "Old Quartz Industry" of Georgia and the Carolinas, where axes, choppers, and ground and polished stone tools are very rare.

The available information has resulted in a variety of competing settlement models. Some argue for increased sedentism and a reduction of mobility (see Goodyear et al. 1979:111). Ward argues that the most appropriate model is one which includes relatively stable and sedentary hunters and gatherers "primarily adapted to the varied and rich resource base offered by the major alluvial valleys" (Ward 1983:69). While he recognizes the presence of "inter-riverine" sites, he discounts explanations which focus on seasonal rounds, suggesting "alternative explanations . . . [including] a wide range of adaptive responses." Most importantly, he notes that:

> the seasonal transhumance model and the sedentary model are opposite ends of a continuum, and in all likelihood variations on these two themes probably existed in different regions at different times throughout the Archaic period (Ward 1983:69).

Others suggest increased mobility during the Archaic (see Cable 1982) Sassaman (1983) has suggested that the Morrow Mountain phase people had a great deal of residential mobility, based on the variety of environmental zones they are found in and the lack of site diversity. The high level of mobility, coupled with the rapid replacement of these points, may help explain the seemingly large numbers of sites with Middle Archaic assemblages. Curiously, the later Guilford phase sites are not as widely distributed, perhaps suggesting that only certain micro-environments were used (Braley 1990; cf. Ward [1983:68-69] who would likely reject the notion that substantially different environmental zones are, in fact, represented).

Recently Abbott et al. argue for a combination of these models, noting that the almost certain increase in population levels probably resulted in a contraction of local territories. With small territories there would have been significantly greater pressure to successfully exploit the limited resources by more frequent movement of camps. They discount the idea that these territories could have been exploited from a single base camp without horticultural technology. Abbott and his colleagues conclude, "increased residential mobility under such conditions may in fact represent a common stage in the development of sedentism" (Abbott et al. 1995:9).

From excavations at a Sandhills site in Chesterfield County, South Carolina, Gunn and his colleague (Gunn and Wilson 1993) offer an alternative model for Middle Archaic settlement. He accepts that the uplands were desiccated from global warming, but rather than limiting occupation, this environmental change made the area more attractive for residential base camps. Gunn and Wilson suggest that the open, or fringe, habitat of the upland margins would have been attractive to a wide variety of plant and animal species.

Another point of some controversy is the idea that the groups responsible for the Middle Archaic Morrow Mountain and Guilford points were intrusive ("without any background" in Coe's words) into the North Carolina Piedmont, from the west, and were contemporaneous with the groups producing Stanly points (Coe 1964:122-123; Phelps 1983:23). Phelps, building on Coe, refers to the Morrow Mountain and Guilford as the "Western Intrusive horizon." Sassaman (1995) has recently proposed a scenario for the Morrow Mountain groups which would support this west-to-east time-transgressive process. Abbott and his colleagues, perhaps unaware of Sassaman's data, dismiss the concept, commenting that the shear distribution and number of these points "makes this position wholly untenable" (Abbott et al. 1995:9).

The Late Archaic, usually dated from

6,000 to 3,000 or 4,000 B.P., is characterized by the appearance of large, square stemmed Savannah River projectile points (Coe 1964). These people continued to intensively exploit the uplands much like earlier Archaic groups with, in North Carolina, the bulk of our data for this period coming from the Uwharrie region. At Fort Bragg 39 of the 196 sites contained Late Archaic components (Loftfield 1979), suggesting a leveling off, or even slight decline, from the earlier Middle Archaic. While the data must be viewed cautiously, they may provide some support to Phelps' (1983:25) contention that the Archaic population stabilized during the Morrow Mountain phase.

One of the more debated issues of the Late Archaic is the typology of the Savannah River Stemmed and its various diminutive forms. Oliver, refining Coe's (1964) original Savannah River Stemmed type and a small variant from Gaston (South 1959:153-157), developed a complete sequence of stemmed points that decrease uniformly in size through time (Oliver 1981, 1985). Specifically, he sees the progression from Savannah River Stemmed to Small Savannah River Stemmed to Gypsy Stemmed to Swannanoa from about 5000 B.P. to about 1,500 B.P. He also notes that the latter two forms are associated with Woodland pottery.

This reconstruction is still debated with a number of archaeologists expressing concern with what they see as typological overlap and ambiguity. They point to a dearth of radiocarbon dates and good excavation contexts at the same time they express concern with the application of this typology outside the North Carolina Piedmont (see, for a synopsis, Sassaman and Anderson 1990:158-162, 1994:35).

In addition to the presence of Savannah River points, the Late Archaic also witnessed the introduction of steatite vessels (see Coe 1964:112-113; Sassaman 1993), polished and pecked stone artifacts, and grinding stones. Some also include the introduction of fiber-tempered pottery about 4000 B.P. in the Late Archaic (for a discussion see Sassaman and Anderson 1994:38-44). This innovation is of special importance along the Georgia and South Carolina coasts, but seems to have had only minimal impact in North Carolina.

Although fiber-tempered pottery has been known from southeastern North Carolina since at least the late 1950s when it was collected from 31Cb4, it was not formally defined until South's 1960 survey of the coast (South 1976). Initially it was assumed to be limited to the South Carolina border area, but by the early 1970s Phelps was identifying specimens from the Greene County area (Phelps 1983:26). By the 1980s fiber-tempered wares were recognized from at least 38 sites scattered throughout the coastal plain of North Carolina. Phelps notes, however, that only what might be called Stallings Plain is found, suggesting that "the full-fledged ceramic series with its decorative types did not extend into the South Coastal region" (Phelps 1983:26). The pottery is typically associated with Savannah River Stemmed points, steatite pottery or disks, and grooved axes. The significance of the ware declines dramatically northward to the Tar drainage (Phelps 1983:Figure 1.4) and it is partially on this distribution that Phelps bases the development of two regions within the North Carolina coastal plain.

Fiber-tempered pottery has been reported from only two sites on Fort Bragg and only one site has produced Thom's Creek pottery (Braley 1990:9; Loftfield 1979). Robinson (1986:75) mentions that fiber-tempered pottery, while not common, is present and especially singles out 31CD151 as worthy of attention.

There is evidence that during the Late Archaic the climate began to approximate modern climatic conditions. Rainfall increased resulting in a more lush vegetation pattern. The pollen record indicates an increase in pine which reduced the oak-hickory nut masts which previously were so widespread. This change probably affected settlement patterning since nut masts were now more isolated and concentrated. From research in the Savannah River valley near Aiken, South Carolina, Sassaman has found considerable diversity in Late Archaic site types with sites occurring in virtually every upland environmental zone. He suggests that this more complex settlement pattern evolved from an increasingly complex socio-economic system. While it is

unlikely that this model can be simply transferred to the Sandhills of North Carolina without an extensive review of site data and micro-environmental data, it does demonstrate one approach to understanding the transition from Archaic to Woodland.

Woodland Period

As previously discussed, there are those who see the Woodland beginning with the introduction of pottery. Under this scenario the Early Woodland may begin as early as 4,500 B.P. and continued to about 2,300 B.P. Diagnostics would include the small variety of the Late Archaic Savannah River Stemmed point (Oliver 1985) and pottery of the Stallings and Thoms Creek series. These sand tempered Thoms Creek wares are decorated using punctations, jab-and-drag, and incised designs (Trinkley 1976). Also potentially included are Refuge wares, also characterized by sandy paste, but often having only a plain or dentate-stamped surface (Waring 1968). Others would have the Woodland beginning about 3,000 B.P. and perhaps as late as 2,500 B.P. with the introduction of pottery which is cord-marked or fabric-impressed and suggestive of influences from northern cultures.

Regardless, it is between 4,000 and 3,000 B.P. when Phelps (1983:26-27, Figure 1.2) notes that the coastal plain can be divided into a northern and southern region. Our attention will focus on the southern region, along with brief remarks on the adjacent Piedmont.

Along the southern coastal plain a northern-influenced ware which Loftfield (1976:149-154) terms New River is associated with the Early Woodland. Essentially identical to the Deep Creek pottery identified by Phelps (1983:29-31) for the north coastal area, this pottery is tempered with coarse sand making it feel sandy to the touch.[4] The pottery, according to Loftfield may be "thong-marked" (i.e., simple stamped), cord-marked, net-impressed, fabric-impressed, and plain (often smoothed). Phelps suggests subsuming the New River into Deep Creek "in order to standardize typology across the Coastal Plain" (Phelps 1983:31). This has apparently not attracted much support, although frankly neither has the use of Loftfield's New River type. One factor which certainly complicates such efforts is the near total absence of excavation data coupled with good radiocarbon dates (a problem admitted by Phelps [1983:32]). Little is known about possible cultural associations, although there is some limited evidence that at least some of the small variants of the Savannah River Stemmed may be found with Early Woodland materials. For example, Oliver notes the co-occurrence of Gypsy Stemmed points with Swannanoa pottery, dated to about 200 B.C. at the Warren Wilson site (Oliver 1981:185). John Davis reports the association of a Gypsy Stemmed point with Yadkin pottery (although Badin is also reported) radiocarbon dated to between 410 B.C. and A.D. 10 at 31FY549 (Davis 1987:1, 5).[5] The large triangular Roanoke point (South 1959:146-148) is likely also associated with Early Woodland ceramics.

In spite of our near total ignorance of Early Woodland sites, many suggest that the subsistence economy was based primarily on deer hunting and fishing, with supplemental inclusions of small mammals, birds, reptiles, and shellfish. This is based on the continuation of a generalized Late Archaic pattern, which may or may not be

[4] In North Carolina, as in South Carolina, type descriptions tend to be loosely written with attributes poorly defined. To further complicate typological issues, there is almost no petrographic or chemical studies of these wares. Consequently, descriptive references such as "sandy," "coarse," and "fine" are meant only as general statements.

[5] Although very interesting, this feature should be cautiously interpreted since the carbonized material came from a depth of only 4 to 12 cm below the ground surface and Davis notes that the feature was somewhat dispersed by "natural processes." Further, the association of what is reported as both Badin and Yadkin pottery in the same feature may help account for the relatively large radiometric span. Billy Oliver (personal communication 1996), however, reports that another similar feature was also recovered from this site, although it has not been reported.

appropriate.

Further to the west, in the Piedmont, the Early Woodland is marked by a pottery type defined by Coe (1964:27-29) as Badin.[6] This pottery is identified as having very fine sand in the paste with an occasional pebble. Coe identified cord-marked, fabric-marked, net-impressed, and plain surface finishes. Beyond this pottery little more is known about the makers of the Badin wares than is known about those who made New River wares.

Somewhat more information is available for the Middle Woodland, typically given the range of about 2,300 B.P. to 1,200 B.P. The best data concerning Middle Woodland Coastal Zone assemblages comes from Phelps' (1983:32-33) work in the north coastal region and can be only cautiously extended to either the southern coast or the Sandhills. The pottery is his Mount Pleasant series which includes very coarse quartz temper and exhibits fabric-impressed, cord-marked, net-impressed, and plain surface treatments. Associated items include small varieties of the Roanoke Large Triangular points, Yadkin points, sandstone abraders, shell pendants, polished stone gorgets, celts, and woven marsh mats. Significantly, both primary inhumations and cremations are found. It seems to be characterized by a pattern of settlement mobility and short-term occupation. Phelps (1983), for example, notes a decrease in the number of small sites along the smaller tributary streams and an increase in the number of sites along major streams and estuaries. He suggests the presence of seasonal subsistence camps (focused on either coastal shellfish or riverine species further inland) coupled with sedentary villages. The shift in settlement patterns, according to Phelps, may be related "to increased dependence on domesticated plants" (Phelps 1983:35), a conclusion with very little support.

In the southern region the dominant pottery is either the Cape Fear or Hanover wares, although very little is known about the groups which produced these ceramics. The Cape Fear pottery is sand tempered and surface decorations include cord-marked, fabric-marked, net-impressed, and plain. Phelps equates the Cape Fear wares with his Mount Pleasant pottery. He notes that:

> the Cape Fear ceramic types described by South (1976:18) are essentially similar to the Mount Pleasant series and Haag's [1958] "grit-tempered," and both of these have been included in the Mount Pleasant definition to provide a comprehensive ceramic horizon across the Coastal Plain (Phelps 1983:35).

The Hanover pottery is distinguished by clay and sherd temper with some suggestion that the majority of the temper is composed of crushed sherds. The Hanover wares are fabric-impressed, cord-marked, and plain (see South 1976:16-18). Loftfield, rather than accepting South's Hanover type, chose to develop the Carteret Series (Loftfield 1976:154-157). Loftfield also offers a type description for the Onslow Series, a crushed quartz tempered ware with cord-marked and fabric-impressed surfaces. He noted, however, that Onslow pottery was found at only six sites and its chronological position, while placed in a Middle Woodland context between his Carteret and White Oak series, was poorly understood (Loftfield 1976:199). This pottery seems to have some superficial resemblance to the Piedmont Yadkin series (discussed below), but is rarely referred to in publications today.

One of the few distinctive features of the coastal plain (and Sandhills) Middle Woodland[7]

[6] The ceramics suggest clear regional differences during the Woodland which seem to only be magnified during the later phases. Ward (1983:71), for example, notes that there "marked distinctions" between the pottery from the Buggs Island and Gaston Reservoirs and that from the south-central Piedmont.

[7] Their association with the Middle Woodland, in many cases, is tenuous. Phelps, in fact, notes that he places them with his discussion of Cape Fear "because their content and occurrence elsewhere in the eastern Woodlands area" (Phelps 1983:35). There are some good reasons to suggest that they span a greater time period,

appears to be the presence of low sand burial mounds. One of the most thorough overviews is offered by MacCord (1966), although Wilson (1982) offers a fresh review and a detailed assessment of one such mound. Artifacts are typically sparse, consisting of platform pipes, an occasional cord marked, sand-tempered sherd, celts, shell beads, copper beads, and a few triangular projectile points. Human remains include cremations, bundle burials, multiple burials, and flexed burials. The frequency of secondary burials suggest that a number of individuals were interred only after some form of reduction. Further complicating analyses, the human remains are frequently in very poor condition (the probable result of the acid soils and loose sands).

Wilson's (1982) study of the McFayden Mound, Bw°67, is particularly interesting since she was able to roughly calculate the life expectancy of the population — 19.9 years at birth. While this estimate seems low when compared to other prehistoric populations it is close agreement with that found at more Northern ossuaries. It was also possible to reconstruct the population size which is, of course, dependent on the number of years of deaths represented in the mound. Relying on ethnohistoric data, Wilson suggests a population size of around 200 individuals, a seemingly reasonable estimate for Woodland models which might focus on macro-bands.

Some have suggested that this elaboration of burial customs suggests changes in social organization and that it also implies a more sedentary lifestyle. This, in turn, has led to discussions of possible horticultural activities during the Middle Woodland. We concur with Ward's (1983:73) assessment that while there is certainly convincing evidence of horticulture in other regions, there is virtually no evidence of domesticated plant foods in North Carolina before, at the earliest, the Late Woodland.

Moving to the Piedmont the dominant Middle Woodland ceramic type is typically identified as the Yadkin series. Characterized by a crushed quartz temper the pottery includes surface treatments of cord-marked, fabric-marked, and a very few linear check-stamped sherds (Coe 1964:30-32). It is regrettable that several of the seemingly "best" Yadkin sites, such as the Trestle site (31An19) explored by Peter Cooper (Ward 1983:72-73), have never been published.

At Fort Bragg the Middle Woodland period (2,300 B.P. to 1,200 B.P.) is better represented than the earlier Woodland phase. Over 5% of the diagnostic sites produced Yadkin projectile points (Braley 1990). Undifferentiated Woodland artifacts were found at 115 (or 58.7%) of the 196 sites identified by Loftfield (1979) which suggests a great increase either in population or land use in this area (Braley 1990).

In some respects the Late Woodland (1,200 B.P. to 400 B.P.) may be characterized as a continuation of previous Middle Woodland cultural assemblages. While outside the Carolinas there were major cultural changes, such as the continued development and elaboration of agriculture, the Carolina groups settled into a lifeway not appreciably different from that observed for the previous 500-700 years. From the vantage point of the Middle Savannah Valley Sassaman and his colleagues note that, "the Late Woodland is difficult to delineate typologically from its antecedent or from the subsequent Mississippian period" (Sassaman et al. 1990:14). This situation would remain unchanged until the development of the South Appalachian Mississippian complex (see Ferguson 1971).

Phelps would challenge this view, at least for the north coastal region, holding instead that "from A.D. 800 onward archaeological assemblages of the Late Woodland period in the North Coastal region can be related to ethnohistoric information and studies, thus providing the relative comfort of

perhaps into the Late Woodland. Wilson (1982:161-162), for example, presents some relatively strong evidence that at least one mound, Bw°67, may date as late as A.D. 1300. This is supported by the presence of a stone pipe comparable to those found at Uhwarrie phase sites, the presence of Adam's Creek pottery (possibly proto-historic), and cranial measurements which strongly resemble Piedmont Siouan populations.

social and linguistic identities and the use of the direct historical approach" (Phelps 1983:36). In the north Phelps has done a superb job identifying the Carolina Algonkians (on the coast) and the Tuscarora (on the interior). The Algonkians are associated with the Colington phase and the associated pottery is shell-tempered with fabric-impressed, simple-stamped, plain, and incised surface treatments (Phelps 1983:36, 39-43; see also Gardner 1990; Phelps 1981, 1982, 1984). The inland Tuscarora appear to have been producing the Cashie series pottery, which is tempered with grit and pebbles and has fabric-impressed, simple-stamped, incised, and plain surfaces (Phelps 1983:37-39, 43-47).

For the south coastal region information is considerably less secure and ethnohistoric placement is confounded by a seeming mix of Siouan, Algonkian, and perhaps even Muskhogean linguistic and cultural traits. South offers a brief synopsis of enthohistoric data for the south coast (1976:5-8) and associates these mixed groups with his Oak Island complex, which Phelps (1983) adopts. Loftfield found similar evidence, although he chose to designate the material White Oak (Loftfield 1976:157-163). One of the earliest detailed south coastal studies was Loftfield's examination of the Uniflight site in Onslow County (Loftfield 1978). Loftfield found a late spring/early summer period occupation and went on to suggest a seasonal adaptive cycle for the region which included dispersal to the estuaries. The predominant food remains, according to Loftfield, were shellfish. His excavations also revealed the village, with two houses discernable. They measured about 13 m in length and 6 m in width, with posts placed at 10 to 20 cm centers. Perhaps the best evidence associating the Oak Island wares with a specific ethnic group is the research conducted at a New Hanover County ossuary where the skeletal population was identified as Siouan (Coe et al. 1982).

Phelps (1983:48) notes that Loftfield's work has been concentrated adjacent to the presumed regional border and that additional work is necessary. He also remarks that it seems likely there may be different interior and coastal expressions for the Oak Island phase.

Moving into the Piedmont, the Late Woodland is typically associated with small triangular points such as Uwharrie, Caraway, Pee Dee, and Clarksville (Coe n.d., 1964;49; Oliver 1985; South 1959:144-146). The characteristic pottery is the Uwharrie series which contains crushed quartz (one characteristic of which is its tendency to protrude through the wall of the pottery). This series included cord-marked and net-impressed surface treatments. The ware was described by Coe in the unpublished Poole site report (Coe n.d.).[8] This pottery appears to represent an evolution from the earlier Yadkin wares (Coe 1995:156). Of equal interest is a radiocarbon date of A.D. 1610, suggesting that this pottery lasted well into the protohistoric. Coe also notes that "Town Creek and other villages situated along the fall line between the Piedmont and the Coastal Plain seem to have formed a southern boundary for the production and use of Uwharrie ware," which he suggests was made by the ancestors of the Sara, Tutelo, Occaneechi, Saponi, and Keyauwee (Coe 1995:158). If this is correct, Uwharrie pottery may be exceedingly rare in the Fort Bragg area.

Unfortunately, excavated sites are as difficult to come by as well published and distributed type descriptions. Results of excavations at one of the more interesting Uwharrie sites, Yd'1 (Coe 1972), have never been published. This site was first explored in 1957, at which time 28 human burials, two dog burials, and 42 features were recovered. In 1972 further work identified 83 features, although no additional burials were encountered. The features were classified as storage pits (with either straight walls and flat bottoms or bell-shaped), hearths, and refuse pits.

Moving from the Late Woodland into the proto-historic period at least some of the clouds surrounding the Piedmont dissipate, largely as the

[8] This study was intended to be published under a monograph series entitled, *University of North Carolina Laboratory of American Archaeology Publications*, but was never completed. The work was conducted in 1936, although the ensuing report is undated.

result of Wilson's (1983) extraordinary efforts to make sense out of nearly 50 years of confusion. There is some considerable evidence that the descendant of the Uwharrie pottery is the Dan River Series (Lewis 1951:242-259; Gardner 1980:54-55; Wilson 1983:249-267, 270-277, 282-296). One of the more interesting conclusions of Wilson's work is that:

> the pottery from the Catawba River during the Late Prehistoric period is markedly different from that of the Dan River region. Bowl forms, surface finishes and decorations differ significantly between the two areas. The presence of burnished and complicated stamped surfaces, cazuella and hemispherical bowl forms, the use of circular reed punctations to create "pseudo-nodes," and applique rim strips, all illustrate the direct influence that emanated from the Pee Dee, and Pee Dee related, culture (cf. Reid 1965, 1967) of the Wateree River in South Carolina, and the Little River section of the Pee Dee River in south-central North Carolina. . . . An attempt to incorporate these foreign modes of surface finish, vessel shape and decoration, similar to that illustrated in the 31Id31 material, is not evidenced at this early date in the Dan River assemblage. The differences between the Dan River and the Catawba River collections in the placement of decorations, the decorative elements that occur, and the association of these designs with vessel forms and surface finish, underscores this interaction dichotomy (Wilson 1983:315).

Curiously, South (1972) makes a somewhat similar observation for the coastal plain linguistic groups, noting considerable cultural attributes cross-cutting the historic Muskhogean and Siouan linguistic boundary. Archaeology at the Payne site in neighboring Moore County also found evidence of possible interaction between Pee Dee and Siouan cultures. Both Pee Dee and Uwharrie pottery were found at the site, possibly suggesting an intrusion of the South Appalachian Mississippian into this otherwise seemingly Siouan village. Further work at such border sites may help explain the introduction and use of corn by Siouan groups as well as the acquisition of a carved paddle stamped pottery tradition (Mountjoy 1989:19-20).

Widmer (1975) and Loftfield (1979) have suggested that settlement patterns on the Inner Coastal Plain did not change from the Archaic period onward, because it was believed that the nutrient deficient soils were not well suited for agriculture. Braley (1989) found, however, that the Late Woodland period sites at Fort Bragg do exhibit differences from the earlier period since there were more Woodland sites than any other type and because there were minor, but statistically significant differences in the sizes of upland and lowland Woodland sites. Although agriculture may not have been a significant aspect of Late Woodland life, the populations appear to have become more sedentary and the lowland, river-oriented terrain took on greater importance (Braley 1990:12).

South Appalachian Mississippian

The Pee Dee culture was defined through the excavations of Joffre Coe at Town Creek which is located about 65 km west of Fort Bragg (Coe 1995; Reid 1967). The site, generally accepted to represent a northern intrusion of a Mississippian chiefdom, was originally dated from about A.D. 1550 to 1750, although more recent analyses suggests a date more likely between A.D. 900 and 1400 (Coe 1995:159).

Braley (1990) indicates that Pee Dee ceramics, which are typically diagnostic of the Mississippian period, are lacking at Fort Bragg. The lack of Pee Dee ceramics suggest that the prehistoric or proto-historic societies of the Fort Bragg area were relatively unaffected by these cultural events (Braley 1990:12). It is also possible that areas which would typically contain large

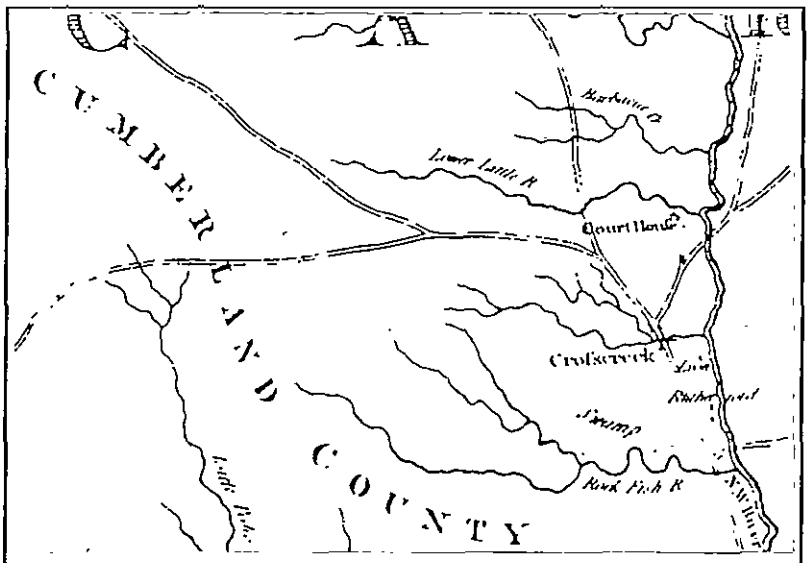

Figure 22. Mouzon's *An Accurate Map of North and South Carolina* showing the Fort Bragg area in 1775.

The only river navigable by sea-going ships was the Cape Fear, but it was not utilized until the 1720s. This was primarily due to two reasons: the Tuscarora Indians which occupied the region were not subdued until about 1715 and during the 1710s pirates controlled the Cape Fear and used it as a base of operations (Rankin 1989; Schonhorn 1972:137). Two cities developed in the 1720s at the mouth of the Cape Fear (Brunswick and Wilmington) which helped to provide a viable transportation and distribution network. By 1724, the land office for the Cape Fear region opened and settlement began to take place along the river. By the 1730s Scottish Highlanders began to

Mississippian sites were not examined by Loftfield to any degree. Large river terraces associated with the Lower Little River may not have contained many fire breaks or other exposures to provide easy discovery. It is possible that future work in these areas will provide evidence for Mississippian occupation.

Historic Overview

It was nearly a century after the failure of the Roanoke Island colony in the 1580s before a permanent, effective settlement of North Carolina was begun. The colonization of North Carolina was not well promoted by the English due to its shoreline being inaccessible. They, therefore, turned their attention toward Charleston and the Chesapeake region. As a result, North Carolina settlers most often came over land by way of other colonies such as South Carolina, Virginia, and Pennsylvania (Meyer 1961:69-71). These settlers were described as the "dregs and gleanings of all the other English Colonies" (McCusker and Menard 1986:170).

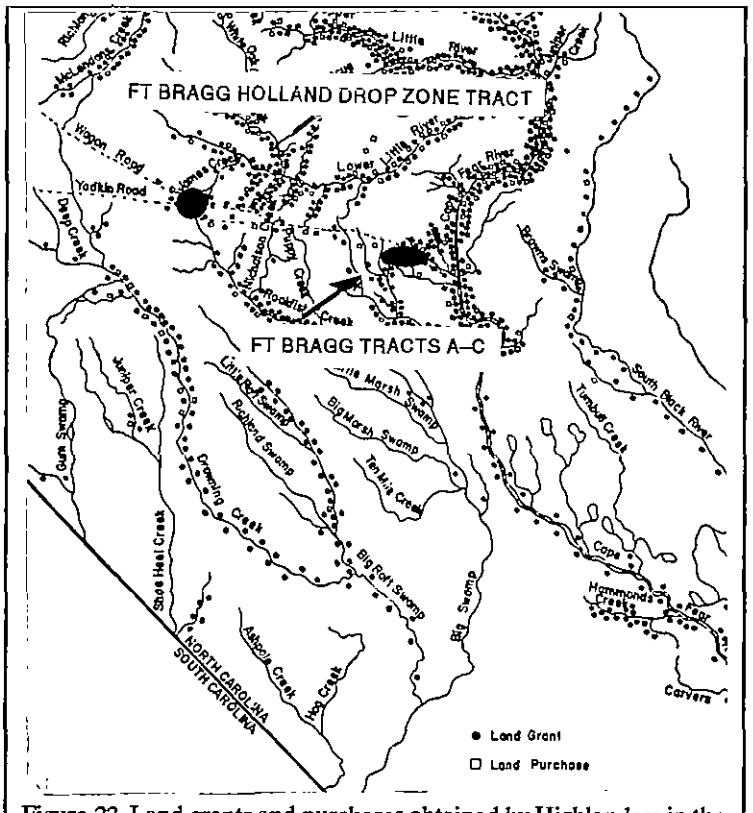

Figure 23. Land grants and purchases obtained by Highlanders in the project areas between 1733 and 1775 (adapted from Meyer 1961:Map VIII).

settle the Cape Fear region near present day Fayetteville (Meyer 1961:71-72).

Lefler and Newsome (1973) state that there were a number of Ulster Scots (or Scotch-Irish) who also settled the area although it appears that the bulk of their grants and purchases were in present day Sampson and Duplin counties. Other Ulster Scot settlements were on the Yadkin, Catawba, and Eno rivers. Oates (1972:14) states that there was an Irish colony on the upper Northeast Cape Fear in 1736, but does not provide details.

It is interesting to note that the Highlander culture was so dominant and persistent in the area that in 1828 a tourist noted that the post office had to hire a clerk who could speak both English and Gaelic (Ross 1965:300). Oates (1972:621) notes that even up to the Civil War era that there were a few surviving Gaelic speaking inhabitants. The Longstreet Church cemetery, located about 7.5 km southwest of survey tract "A" contains at least one antebellum epitaph in Gaelic (Kern and Boyko 1996; Ross 1965:300).

One thorough exploration of the importance of British folkways in the development of the American culture is Hacket's (1989) *Albion's Seed* in which he explores the four principal migrations. While the Highland Scots is not one of these, his brief comments are worth repeating:

> another colonial culture developed in North Carolina's Cape Fear Valley, where Highland Scots began to arrive circa 1732. Many followed after the '45 Rebellion, and by 1776 their numbers were nearly as large as the white population in the South Carolina low country. Other ethnic groups also settled in the Cape Fear Valley, but so dominant were highlanders that Gaelic came to be spoken in this region even by people who were not Scots. . . . Even in the twentieth century, the Cape Fear people sent to Scotland for ministers, who were required to wear the kilt, play the pipes, and preach in Gaelic.
>
> The political history of the culture was very different from its border neighbors. During the American Revolution the borderers were mostly Whigs; Scottish highlanders were mainly Tory. In the new republic, the backsettlers tended to vote Democratic-Republican, and the highlanders of the Cape Fear Valley voted Federalist. Historian Duane Meyer writes that these people were "remarkedly consistent in choosing the losing side." They never became part of the solid south; in 1900 they cast their ballots for McKinley rather than Bryan. Here was another culture that preserved its separate identity into the twentieth century (Hacket 1989:818-819).

During the early period settlement grew up along the rivers and creeks. The community of Argyle grew up along an early road which closely follows the alignment of modern-day Longstreet Road. However, road-oriented settlement was unusual since much of the sandy upland soils were unsuitable for productive farming. According to Hudson (1984:53) the Blaney-Gilead-Lakeland soil association which dominates the north half of Hoke County is not classified by the U.S. Department of Agriculture as prime farmland.[9] These soils are also not listed as being state or locally important farmland, which means while not prime farmland, they are suited to producing crops economically only when managed according to modern farming methods (Hudson 1984:53). It seems likely that the Argyle community was more

[9] Prime farmland is defined as containing soils that, "are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have qualities that are favorable for the economic production of sustained high yields of crops" (Hudson 1984:53).

of a mercantile district.

Cumberland County, which incorporated portions of present day Hoke County, was established in 1754 (Corbitt 1950). The first settlement took place near the mouth of Cross Creek and by 1760 the settlement was formally set apart. In 1762 the town of Campbelltown was established near the Cross Creek settlement, and in 1778 the two towns were combined. In 1783 the name was changed to Fayetteville (Lefler and Powell 1973:92). The town is situated on the west bank of the Cape Fear River at the head of its navigable point. Wilmington is 192 km by water, making Fayetteville's position, both in relation to Wilmington and to the interior, valuable during the early historic period.

During the early half of the eighteenth century, settlement in the area was primarily along the Cape Fear river, but as these areas became populated settlement began to occur on the larger streams. Land grants and purchases secured by Highlanders between 1733 and 1775 are illustrated in Figure 23, showing that by the end of the colonial period the area was well settled, at least along the waterways.

The large, vast tracts of long leaf pine spurred on the production of naval stores during the colonial period. These forest resources also led the people of the Cape Fear region to produce items such as lumber, barrels, and other wood products. Crops included corn, rice and other grains. In addition, livestock were raised to supplement the income of the people (Lefler and Powell 1973:93; see also Hill 1983, and McLean and Sellon 1978).

The growth and expansion of the backcountry during the Proprietary period after 1750 created a number of problems including the creation of new counties and equal representation in the legislature. The backcountry citizens complained bitterly about eastern domination since planter aristocracy in the east dominated the control of the provincial government. The unit of representation was the county and there were far more counties in the east than in the rapidly growing west. As population increased in the backcountry, the legislature created more counties in the west, but also created additional counties in the east to guarantee that control would not be lost to the back country. There were nine boroughs in the state and only two of these (Salisbury and Hillsborough) were in the Piedmont. The rest (Bath, Brunswick, Edenton, New Bern, Campbelltown, Halifax, and Wilmington) were in the east. Tension between east and west mounted in 1766 by the passage of an act to establish a permanent capital. The new capital was an eastern borough — New Bern (Lefler and Powell 1973:223-224).

Out of this tension grew a backcountry movement known as the Regulator movement. This name was adopted because their main goal was to obtain the right to regulate their own government. A number of incidents occurred including attacks on court officials in Anson and Johnston counties, and disorders in Rowan and Edgecombe counties. This movement was interrupted by the American Revolution and its aftermath (Lefler and Newsome 1973:236-239).

Cross Creek did see some minor action during the war. Governor Martin, who had previously fled his office due to lack of British military support, worked out a plan for the British conquest of North Carolina. Martin was to raise approximately 9,000 Loyalists. Lord Cornwallis was to sail from Ireland with seven regiments of British regulars and take command of both groups which were to combine in the Wilmington-Brunswick area by mid-February of 1776. In January of that year the plan was approved. On January 10, Governor Martin issued a proclamation asking all loyal subjects to "unite and suppress the rebellion" in North Carolina. In mid-February 1,600 Highlanders led by Donald McDonald were assembled at their rendezvous at Cross Creek and then began their march toward Wilmington. Colonel James Moore, who directed the Whig forces, was determined to keep the enemy from reaching the port. A secondary objective was to take possession of Cross Creek. To achieve these goals, Moore marched his forces to Elizabeth Town; Colonel Alexander Lillington and Colonel James Ashe were ordered to reinforce Caswell and secure Moore's Creek Bridge, 29 km north of

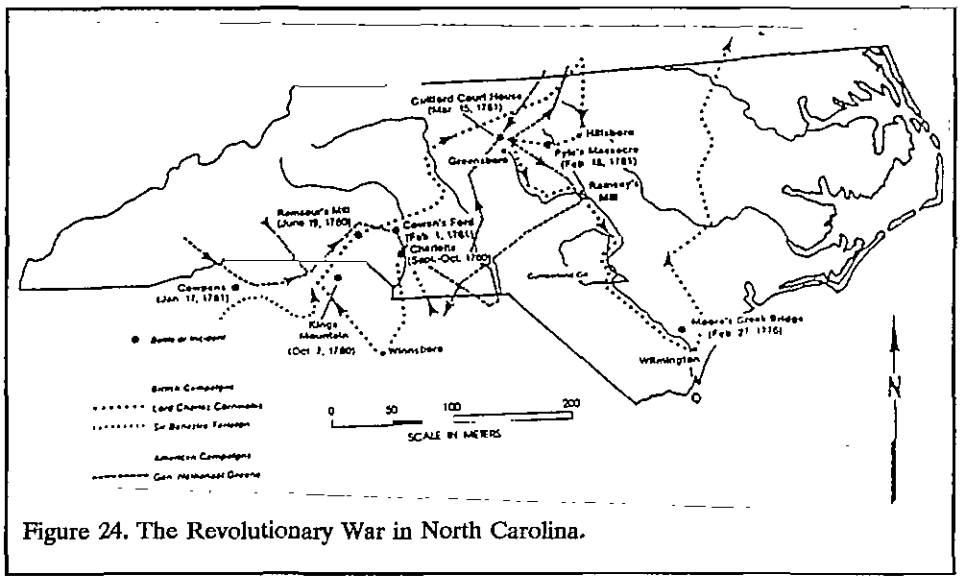

Figure 24. The Revolutionary War in North Carolina.

Wilmington since the Loyalists would have to cross this bridge to reach Wilmington (Figure 24).

The Whig forces reached the bridge before the Loyalists and set a number of traps which made crossing the bridge difficult and added confusion to the ranks. For three minutes the Loyalists were swarmed with swan-shot and musket fire. Soon the battle was over with an overwhelming Whig victory (Lefler and Powell 1973:275-278).

Two events which directly affected the Fort Bragg reservation occurred in 1781 as Lord Cornwallis retreated through Cumberland County on his way to Wilmington from Guilford Courthouse, and when the conflicting loyalties of local Whigs and Tories resulted in the Piney Bottom Massacre.

As Cornwallis was being pursued by Colonel Henry Lee he passed along the edge of Fort Bragg along the Lower Little River. Having no provisions left, the soldiers began to forage the area of Cumberland County. Cornwallis and his troops crossed into what is now Fort Bragg at Monroe's Bridge. While his troops continued on their way, local tradition has it that Cornwallis diverged from the group and headed to Malcolm Smith's house in the Argyle area on present day Longstreet Road where he visited (Nye n.d.:16-21). Unfortunately, this visit is based primarily on local lore.

The Piney Bottom Massacre occurred on August 4, 1781 as a result of a surprise attack on the Whigs by local Tories led by John McNeill (Nye n.d.:22-26). Seven men were killed, one was wounded, and a number of houses were pillaged or burned. Nye (n.d.) locates the massacre site where Morganton Road crosses Piney Bottom Creek although Wicker (1966) disputes this location since Morganton Road was not in place until 1794. He suggests that the massacre occurred nearer to what is today Holland Drop Zone.

The war left North Carolina in a bad situation. It was in debt, its money was worthless, and its English markets were lost. Most of the state's population led a simple, low-level economic existence which made the effects of the war more acute than in surrounding, richer states. Gradually export trade reached a new high. New England replaced Britain as the major customer for goods. Major exports included corn, lumber, and tobacco. Population steadily increased after the war. Census reports from 1790 to 1820 gave the population as 393,751; 478,103; and 638,829 (Lefler and Newsome 1973:2660270).

During the antebellum period there was a remarkable increase in the state's two major cash crops—tobacco and cotton. Agricultural expansion and prosperity were partly due to a systematic movement to improve farming methods and rural life which resulted in the publication of journals such as the *Carolina Cultivator* and *North Carolina Planter* (Lefler and Newsome 1973:390-392). In 1840 the county's products were listed as 6,037 bushels of wheat, 16,577 bushels of oats, 3,019 bushels of rye, 291,630 bushels of corn, 459,747

pounds of cotton, 16,800 pounds of wool, 1,794 barrels of turpentine, and 78,540 dollars worth of lumber (Wheeler 1925:124).

As expressed in the quantity of turpentine and lumber listed above, naval stores were important to the area economy. North Carolina ranked number one as the world's foremost producer of naval stores from 1720 to 1870 (Lefler and Newsome 1973:97). The longleaf pine, which was plentiful in the study area, was the basic resource needed for the industry. Many farmers would produce naval stores during slow agricultural seasons or in bad weather and operations ranged from small to large. On large operations, labor was organized on the task system, much like that found at the Carolina rice plantations.

Frederick Law Olmsted passed through this area on a stage coach road from Raleigh to Fayetteville in 1853. His account of the terrain was precise, like that of an environmental surveyor:

> the road was a mere opening through a forest of the long-leafed pine; the trees from eight to eighteen inches in diameter, with straight trunks bare for nearly thirty feet, and their evergreen foliage forming a dense dark canopy at that height, the surface of the ground undulating with long swells, occasionally low and wet. In the latter case there was generally a mingling of deciduous trees and a watercourse crossing the road, with a thicket of shrubs. The soil sandy, with occasionally veins of clay; the latter more commonly in the low ground, or in the descent to it. Very little grass, herbage, or underwood; and the ground covered, except in the road, with fallen pine-leaves. Every tree, on one, two, or three sides, was scarified for turpentine. In ten miles, I passed half a dozen cabins, one or two small clearings, in which corn had been planted, and one turpentine distillery (Olmsted 1953:138).

His observations concerning many of the region's people were no less sharp:

> The negroes employed in the turpentine business, to which during the last week I have been giving some examination, seem to me to be unusually intelligent and cheerful, decidedly more so than most of the white people inhabiting the turpentine forest. Among the latter there is a large number, I should think a majority, of entirely uneducated, poverty-stricken vagabonds. . . . They are poor, having almost no property but their own bodies; and the use of these, that is, their labour, they are not accustomed to hire out statedly and regularly, so as to obtain capital by wages, but only occasionally by day or job, when driven to it by necessity. A family of these people will commonly hire, or "squat" and build, a little log cabin, so made that it is only a shelter from the rain, the sides not being chinked, and having no more furniture or pretension to comfort than is commonly provided a criminal in the cell of a prison. They will cultivate a little corn, and possibly a few rows of potatoes, cow-peas, and coleworts. They will own a few swine, that find their living in the forest (Olmsted 1953:146-147).

What he described as North Carolina's "proverbial reputation for the ignorance and torpidity of her people" he attributed to "the general poverty of the soil in the eastern part of the state," certainly a reference to the Sandhills and Inner Coastal Plain (Olmsted 1953:148).

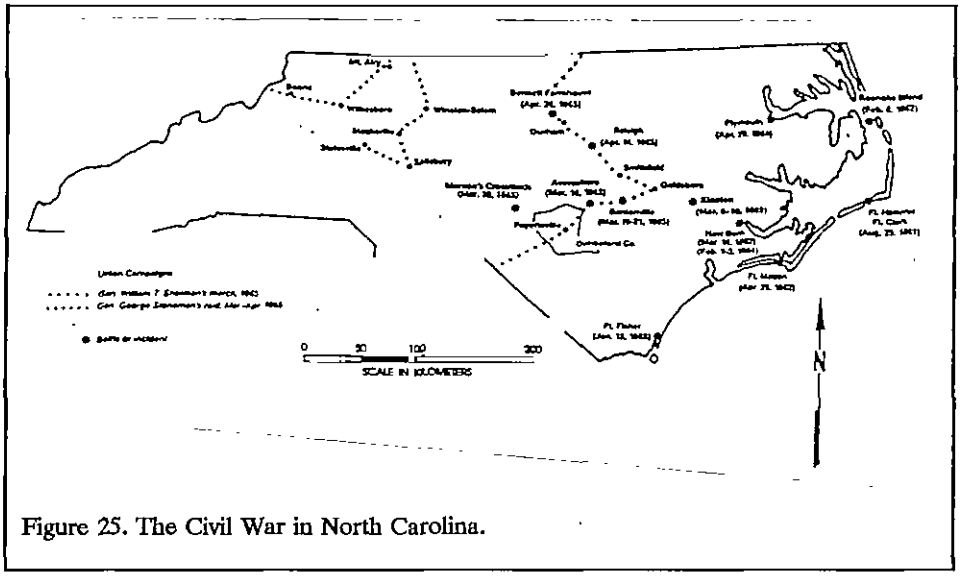

Figure 25. The Civil War in North Carolina.

Cumberland County experienced a slow population growth. In 1790 there were 8,671 inhabitants including 6,407 whites, 2,181 slaves, and 83 free blacks. The greatest jump in population occurred between 1810 and 1820 when the population grew from 9,385 to 14,446 with a 29% increase in the white population, an 83% increase in the free black population, and 41% increase in the slave population. This increase is probably due to the expansion and prosperity of agriculture. However, given the poor soils found in the Fort Bragg area, this population growth probably occurred elsewhere in the county, perhaps closer to Fayetteville.

There was an increase in manufacturing establishments during the antebellum as well. From 1850 to 1860 these establishments increased from 2,663 to 3,689. In 1860 Cumberland County had 84 turpentine distilleries, seven cotton mills, and three iron works (Lefler and Newsome 1973:397-398). Although notable economic advances had occurred in the state after 1840, North Carolina was still relatively poor by the time of the Civil War. It was rural and isolated, and its coast was dangerous and without a good port (Lefler and Newsome 1973:402). Cumberland County's population in 1850 was 12,447 whites, 7,217 slaves; and 946 freedmen (Wheeler 1925:124).

The only military action to take place in the project area during the Civil War was during General William T. Sherman's march in 1865. While Sherman's army was moving north from Savannah to meet Grant's army in Virginia, they passed through Fayetteville (Figure 25), destroying the Confederate Arsenal on March 11. Constructed between 1836 and 1859, this was one of the South's most important military depots (Barrett 1963:311-317; Grunden et al. 1995:15; Lefler and Newsome 1973:459).

Immediately affecting the Fort Bragg

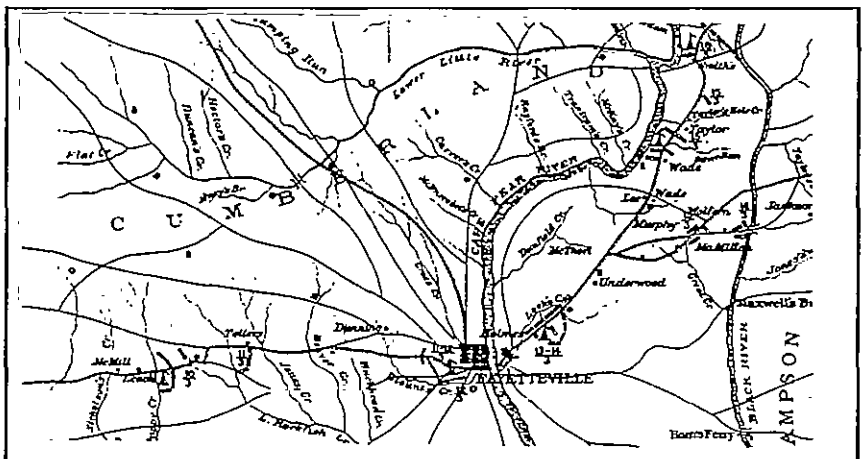

Figure 26. Vicinity of Fayetteville and Fort Bragg in March 1865 (adapted from *Atlas to Accompany the Official Records of the Union and Confederate Armies*, Plate LXXX, Number 8).

reservation was the Battle of Monroe's Crossroads about 13 km west of survey tract "A". A skirmish occurred early on March 10, 1865 when a surprise attack by Confederate forces, under the command of General Wade Hampton, was made on Charles Monroe's house, the temporary headquarters of Brigadier-General H. Judson Kilpatrick. (Barrett 1963:301-317; Guernsey and Alden 1977:720 [1866]; Nye n.d.:42-61). The battle took place in an area encompassing two plantations or farms — Rocky Mount and Green Springs. Although the attack initially favored the Confederates, the Federal troops rallied and retook the camp. Perhaps most importantly, by this time the war was already lost and the battle is little more than a footnote in the tragic conflict.

Immediately after the war, cotton prices peaked, causing many Southerners to plant cotton using free labor, in the hope of recouping losses from the war. The hiring of freedmen began immediately, with variable results. They began with a wage labor system established by the Freedmen's Bureau. Gradually owners turned away from wage labor contracts to two kinds of tenancy — sharecropping and renting. While very different, both succeeded in making land ownership very difficult, if not impossible, for the vast majority of Blacks. Sharecropping required the tenant to pay his landlord part of the crop produced, while renting required that he pay a fixed rent in either crops or money (Orser 1988).

Smith provides a description of the poor soils found in the Sandhills region:

> In the midst of the large bodies of sand-hill lands there are occasional tracts of a fair grade of cultivatable land, generally found on or near the water courses. The sand-hill soils proper will produce almost nothing; they furnish, however, a scant pasturage in the swampy tracts which abound along the sluggish streams. The yaupon and the scuppernong grape flourish even in these sand wastes (Smith 1880:548).

Although the county's population grew up through the twentieth century, the poverty of the Sandhills soil deterred any large scale settlement of areas away from creeks and rivers. Smith (1880) describes the location of cultivable lands. He states that the rivers and creeks have wide areas of bottom lands:

> or are flanked by swamps or oak and pine flats, and on these are made crops of corn, potatoes and rice. Cotton is grown on the better class of uplands of mixed oaks and pines, which are interspersed among the sandy tracts. The forests are open and park-like . . . . In the midst of the large bodies of sand-hill lands there are occasional tracts of a fair grade of cultivatable land, generally found on or near the water courses (Smith 1880:548).

By the turn of the century, Cumberland County's population had increased to 14,952 whites and 12,369 blacks with a total population of 27,321 (State Board of Agriculture 1986:328). The town of Fayetteville grew rapidly after the introduction of a Norfolk and Southern railway line connecting Fayetteville to Raleigh in 1911, paralleling the history of many Southern communities (Lefler and Newsome 1973:586). It was in this year that Hoke County was created out of portions of Cumberland and Robeson counties (Corbitt 1950:124).

The military base at Fort Bragg near Fayetteville was established in 1918 as a field artillery training center. Covering around 60,000 ha, largely in Cumberland and Hoke counties, and named for General Braxton Bragg, Confederate corps commander, it was the largest military reservation in the United States. The land was purchased primarily because it was cheap since the soils were poor. For all the reasons that farmers were uninterested in the area and willing to sell, government officials were interested. In 1922 it became a permanent Army post, and in the 1940s it was described as having:

> a complete system of municipal

> and recreations facilities, a chapel, and a school for children; the buildings are modern, built of brick and stucco. The post organization is made up of four regiments of field artillery with latest equipment. A field artillery board tests experimental matérial on the firing range. Pope Field, the Air Corps station, is garrisoned by Flight C, 16th Observation Squadron, and the Second Balloon Squadron. The landing field has a mile-long runway.
>
> In summer the Reserve Officers Training Corps comes to Fort Bragg for training, units of the North Carolina National Guard encamp for two weeks, and the Citizens Military Training Camp is conducted. Since the establishment of the Civilian Conservation Corps in 1932, Fort Bragg has been headquarters of District A (Federal Writers' Project 1988:326).

In 1952 the 1st Special Operations Command was established and Fort Bragg became the Headquarters for Special Forces, Rangers, and Civil Affairs and Psychological Operations. It is also the home of 18th Airborne Corps, the largest corps in the world, as well as the home of the 20th Engineering Brigade, the 16th Military Police Brigade, the 18th Field Artillery Brigade, the 35th Signal Brigade, the 52nd Military Intelligence Group, and the 1st Corps Support Command (*Charlotte Observer*, May 20, 1984). Fort Bragg has become the largest camp of its kind in the nation, leading to tremendous growth of the surrounding region.

Camp Mackall's military history is somewhat more recent. The post was established in April 1943 when over 26,000 ha of property was transferred from the Secretary of the Interior to the Secretary of War for the purpose of training airborne combat units. The cantonment at Camp Mackall, which included an airfield and nearly 2,000 structures, was used by the 11th, 17th, 101st, and 13th Airborne Divisions until the end of the Second World War.

At the end of the war much of the transferred land was returned to the Secretary of the Interior or the State of North Carolina. Camp Mackall, however, continued to be held by the military and, with the coming of the Vietnam War, a Special Forces training facility was developed at Mackall. Today the facility is still used by Special Forces and the airfield is used for Army rotary wing, Air Force airlift, Low Altitude Parachute Extraction System, and airmobile training.

RESEARCH STRATEGY AND METHODS

Research Goals

The primary goals of this survey were to identify, record, and assess the significance of archaeological sites within the 625.73 ha Holland Drop Zone survey tract and the 243.81 ha Fort Bragg general survey tracts. As stated earlier, this work is being done in order to fulfill compliance with the National Historic Preservation Act (Public Law 89-665, as amended by Public Law 96-515) Guidelines for Federal Agency Responsibilities, under Section 110 of the National Historic Preservation Act, Army Regulation AR 420-40, and 36CFR800 (Protection of Historic and Cultural Properties).

Preservation efforts offer important economic, tourism, and education opportunities (see, for example, Rypkema 1990). Yet, understandably these are of little consequence to a government agency whose mission statement is national defense. Clearly, in such a case, the motivation is compliance with law. In spite of this, preservation offers intangible benefits, such as external benefits to society, which are worthy of careful consideration. U.S. Representative John Lewis from Georgia has remarked that, "it is not enough to learn from history or a movie, we must make sure that these precious pieces of our history are preserved." Knowing and understanding our past, many have argued, creates better citizens and hence a better society.[1] Citizens take greater pride in their city's, county's, and country's historical achievements. This pride naturally boosts morale and enhances civic participation. Native American and African American groups can rightly take pride in the expression of their unique ways of life, their history, and their contribution to our Nation. Exploration of our past reveals the heights of which humanity is capable. The study supplies continual inspiration and promise. The exploration of the past makes it possible to keep on seeing, thinking, and reflecting afresh — and this freshness and willingness to explore the past is essential to the democratic process. Exploration of the past may offer social commentary by providing new insights into past lives, or how society reacted to past pressures. It may even help us to better understand the failures of past.

It is also important that a country which has so strongly advocated educational improvement and reform should also understand the irreplaceable role that historic and prehistoric resources can play in teaching us about our heritage. It is essential that the next generation of citizens understand the stories hidden within our archaeological sites and in our historic churches, houses, factories, and communities. The ability to reach out and touch the past, forming a strong and clear link between yesterday and today, offers an unforgettable understanding of another way of life and helps our children better understand the fabric of life in our country. By exploring and emphasizing African American and Native American history it is possible to strengthen the understanding that our heritage is the combined history and culture of all of our citizens.

Oftentimes historic preservation, through the exploration of the past, may challenge rather than reassure, and provoke rather than sooth. Archaeological research, in many ways, offers much more than history ever can since history is largely written by the well educated, the wealthy, and the white. History tends to ignore the poor, the underclass, the illiterate, making them invisible people. History is what others want us to know, archaeology offers the opportunity to explore the reality of the past without the filter of subjectivity

[1] One of the earliest discussions of preservation for patriotic reasons is Charles B. Hosmer, Jr.'s *Presence of the Past*, a history of preservation in America up to 1926. He reveals that long before even the Civil War, America's need to create a national identity manifested itself in efforts to preserve historic sites.

added by some, perhaps many, historical accounts. Archaeology offers the potential to explore the lives of African American slaves that are largely known only through the dry history of white slave-owner account books and plantation diaries. While slave owners were concerned with how many acres a slave could hoe, or how much they had to be fed, the owner was rarely interested in how slaves lived, died, ate, or made their house a home. Likewise, our understanding of Native American groups in the historic period is dominated by traders and occasional visitors who had clear reasons for coloring their accounts. Archaeology offers the only opportunity for better understanding the reality of the past.

Part of this reality is also the understanding that history is not made up of single events, or great people, or unique ideas alone. As Tony Wrenn and Elizabeth Mulloy explained nearly two decades ago:

> Events are only punctuation marks; the process itself is history. It takes days and days of irritation and heat and insult, and grievance to provoke a revolution. A bicentennial commemorates 200 years — not just the years on either side of a hyphen (Wrenn and Mulloy 1976:15).

History is fluid and on-going. It involves both the great and the small. Archaeological studies help us better understand both the continuum and also the importance of the common person.

Many also point out that historic preservation is a "merit good" — simply because preservation is an important part of life, its perpetuation and dissemination merits government support. Like food, shelter, and education, some feel that everyone should be entitled to a minimum quantity and standard of historic preservation experience, whether that be exposure to historically significant buildings, a better understanding of past industrial technology, or the ability to explore Native Americans who lived thousands of years ago. The government allows preservation efforts to be available and emphasizes their importance by support of preservation on government facilities and land.

Inherent in the understanding of merit good is the realization that, without subsidy, the cost of historic preservation is too high relative to most consumer's incomes. In other words, were it not for government intervention it is unlikely that much of the educational aspects of preservation would widely exist or be available for the public benefit. Only the wealthy would be able to afford private preservation "experiences." It follows that there is an intrinsic wrong in making our history available to only the richest 20% of the population, who are likely to represent a very biased cross-section of our society.

However, in addition to the legally mandated goals of this study, we identified and incorporated a range of secondary goals which reflect an effort to address at least some of the issues identified as important to the discipline. These included both methodological issues, whose answers will help to better and more cost-effectively undertake survey and preservation efforts, and research issues, whose answers will help to better explore and refine our understanding of the past. The secondary goals of this survey included:

- the examination of changing prehistoric land use;
- the affects of clear-cutting and long-term exposure on archaeological sites;
- the effectiveness of 30 m interval transects at locating significant resources;
- changing lithic material preferences; and
- site function/duration based on artifact content.

No major analytical hypotheses were created prior

to the field work and data analysis, although certain expectations regarding the secondary goals will be outlined in these discussions. The research design proposed for this study is, as discussed by Goodyear et al. (1979:2), fundamentally explorative and explicative.

As stated above, the primary goals of this survey were to identify, record, and assess the significance of archaeological sites within the survey tract. The latter aspect involves the sites' eligibility for inclusion on the National Register of Historic Places, although Chicora Foundation only provides an opinion of National Register eligibility and the final determination is made by the lead compliance agency, the United States Army, in consultation with the State Historic Preservation Officer at the North Carolina Department of Cultural Resources.

The criteria for eligibility for the National Register of Historic Places is described by 36CFR60.4 and states that:

> [t]he quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> b. that are associated with the lives of persons significant in our past; or
>
> c. that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> d. that have yielded, or may be likely to yield, information important in prehistory or history.

It is generally accepted that "the significance of an archaeological site is based on the potential of the site to contribute to the scientific or humanistic understanding of the past" (Bense et al. 1986:60). Butler suggests that the only valid measurement of significance must be based on what he calls the "theoretical and substantive knowledge of the discipline" at any particular moment in time (Butler 1987:821). While the use of this approach over that developed by Glassow[2] (1977) has been suggested, Butler himself acknowledges, "we cannot foresee future research questions, and we may not possess the theory to interpret and understand all that is present" (Butler 1987:822). At this point in time it seems essential to recognize the importance of asking the right questions at the right sites, not limiting the number of sites at which questions are asked, or what questions are posed. Clearly, asking "right questions" at the "right sites" can be difficult and requires an understanding of the "theoretical and substantive knowledge of the discipline" (Trinkley

[2] Glassow's (1977) approach to evaluating site eligibility is through the use of five properties: site integrity, site clarity, artifactual variety, artifactual quantity, and site environmental context. These qualities stress properties of the archaeological record. *Integrity* refers to the degree of preservation or amount of in situ remains present at a site. It relates to the condition and amount of archaeological artifacts, ecofacts, and features found at a site. *Clarity* indicates how well the strata or subsurface features may be distinguished. *Variety* refers to the qualitative variability in the archaeological remains found at a particular site. *Quantity* refers to the frequency or density of the artifacts or subsurface remains and it is in many ways one of the easiest properties to evaluate (although it is certainly not the most important). The last criterion, *environmental context*, refers to unusual environmental features or zonation which might be important in distinguishing sites or site types.

1990:30-31).

National Register Bulletin 36 (Townsend et al. 1993) provides an evaluative process that contains five steps for forming a clearly defined explicit rationale for either the site's eligibility or lack of eligibility. Briefly, these steps are:

- identification of the site's data sets or categories of archaeological information such as ceramics, lithics, subsistence remains, architectural remains, or sub-surface features;
- identification of the historic context applicable to the site, providing a framework for the evaluative process;
- identification of the important research questions the site *might* be able to address, given the data sets and the context;
- evaluation of the site's archaeological integrity to ensure that the data sets were sufficiently well preserved to address the research questions; and
- identification of "important" research questions among all of those which might be asked and answered at the site.

This approach, of course, has been developed for use documenting eligibility of sites being actually nominated to the National Register of Historic Places where the evaluative process must stand alone, with relatively little reference to other documentation and where typically only one site is being considered.

In the case of a survey which identifies multiple sites the process outlined by Townsend et al. (1993) can become burdensome. Consequently, this study has elected to combine some of the steps, making the process more streamlined, without substantively altering the goal to ensure that sites capable of providing significant information are provided the protection afforded in the historic preservation process. The development of a context was not undertaken for each site, but is found outlined in the prehistoric and historic overview section of this report. The identification of "important" research goals is discussed below, outlining significant research issues such as those identified for the coastal region of North Carolina (Phelps 1983).

Otherwise, the evaluative process was essentially the same as outlined by Townsend et al. (1993). Data sets and integrity are discussed, and reference is made to the possibility of erosion and subsequent deflation that may occur as a result of logging operations within these survey areas. It has been determined in other studies (Trinkley et al. 1996a; Trinkley et al. 1996b) that on sites where erosion/deflation has occurred that the integrity of these sites and other data sets (such as subsurface features) that might have been present are often destroyed. Reference to the prehistoric context is made (when diagnostic material was found) as well as research issues that the site might be able to address.

In his synthesis of prehistoric archaeology of the Coastal Plain, Phelps (1983) listed some of the most important issues regarding the cultural history of the area. While certainly not exhaustive, they are used to help determine which sites identified in the drop zone are important to a better understanding of the local prehistory. Phelps (1983:50) states that these issues include:

> (1) knowledge of Paleo-Indian period site distribution correlated with Pleistocene environment, which would result in settlement and subsistence models to be tested against those currently proposed;
>
> (2) discovery and excavation of either single-component or stratified Paleo-Indian and Archaic period sites to provide more accurate

descriptions of assemblages for each phase and to assay diachronic changes in the assemblages as well as changes in subsistence strategies and other cultural subsystems;

(3) location and excavation of sites that have preserved the transition from the Late Archaic to the Early Woodland to evaluate the impact of new technology introduced in the latter period;

(4) a study of changes in settlement and subsistence patterns during the Early and Middle Woodland periods in order to understand changes resulting from the introduction of cultigens; and

(5) excavation of sites that represent the range of types for each phase of the regional sequences to provide a complete culture history as a platform from which processual studies can be launched (Phelps 1983:50).

Although these issues are rather broad, they provide a good deal of latitude for framing more specific questions. These issues are discussed in greater detail in the Prehistoric Overview section of this report, but it is appropriate to briefly outline a few of the issues raised by Phelps.

His first and second research topics involve the dearth of information available concerning the Paleoindian Period along the North Carolina coast. Associated legitimate questions might include, what constitutes a Paleoindian site? This, of course, raises the question of where the line is drawn either to incorporate Hardaway and Palmer as terminal phases of the Paleoindian or to include them with Archaic traditions. The answer, of course, cannot come solely from typological studies and arguments, but must incorporate the identification and study of both stratified and even single component sites. The study must include the integrated exploration of both the soils and palynological records. Questions are raised concerning the types of landforms and microenvironmental areas in which Paleoindian sites are most likely to occur. Can the distribution of sites help us refine our understanding of Paleoindian subsistence and their use of different habitats? Additional questions are legitimately raised concerning the differing dates suggested for early sites. It is unfortunate that sites like Hardaway were destroyed before appropriate dating could be undertaken, but there are certainly other sites which may contain suitable proveniences and materials. How do the materials from the Sandhills compare, typologically, to those from the Coastal Plain or Piedmont? Is it possible to distinguish differences which might suggest the extent of different settlement systems?

His third question poses the concern of how Late Archaic Savannah River Stemmed point users became Early Woodland Badin or Deep Creek/New River pottery makers. While obviously early, well-dated sites producing Stallings or Thom's Creek pottery would be ideal, the investigation of virtually *any* Early Woodland ceramic site in the North Carolina Sandhills or on the state's Inner Coastal Plain would be exceptional, especially if it were then published. The research goal also should be interpreted to include questioning how the size of Savannah River points seems to have so consistently declined in size. Can stratified sites showing this change be identified? Ranging off from these initial questions, there are a whole series of especially significant issues. Perhaps one of the most intriguing is how the Middle and Late Archaic evolved into the Early and Middle Woodland. What were the processes, both internal and external, which caused this change and how significant was the change on the daily lives of the Native Americans?

This feeds into Phelps' fourth question

concerning cultigens. While his question is phrased to support the assumption that cultigens were present in Early Woodland, it seems that there is little evidence for such a statement anywhere in North Carolina. Therefore, one of the most important research goals might involve a rededication of efforts to seek out floral and faunal remains for intensive study. If they are present, what was their source — introduction from outside the region or internal development of "weedy" plants? What is their context and date? What was the impact of these horticultural efforts, if they existed? Did they cause any real change in the lifeways of the Woodland peoples?

Phelps' final research goal is simple — sites, and lots of them, need to be examined in order to understand the range of diversity present. Sites in the lower Piedmont, sites in the Sandhills, sites in the Inner Coastal Plain, and sites in the Lower Coastal Plain need to be explored to understand the impact of both topography and the environment.

We realize that this lays out a tremendous range of questions. Some of them will likely be unanswerable, at least with our current level of understanding and expertise. And some may perhaps never be answered, lost in the fog of time behind the clouded glass. Yet too often the very asking of questions is ridiculed. While good for a little controversy and a quick laugh at a colleague's expense, such attitudes do nothing to promote the growth of archaeology and they do even less to help the public understand their heritage. Questions, even those which at first appear unanswerable, need to be asked. Without questions research can become little more than the blind acquisition of data.

One of the secondary goals we outline was to examine changing prehistoric land use. The CZR survey (Loftfield 1979) found that sites are commonly located on hill tops, toe slopes, upland flat areas, and saddle-like settings. The majority of sites were within 100 m of a water source on sandy soils. However, no attempt was made to determine land use through time. Braley (1990) has made some general statements regarding land use based on Loftfield's (1979) study as well as his study of the Northern Training Area (Braley 1989) (see also Braley 1990:3-13). These changes are discussed in the Prehistoric Overview section of this report.

Since at least some portions of the Holland Drop Zone survey tract has been and will be clear cut, thus exposed, there exists the possibility to explore the process and affect of erosion/deflation at known archaeological sites. Questions concerning what effect this will have on a sites' ability to address significant research questions, and therefore their eligibility for the National Register of Historic Places, may be answered. The information recovered during the present survey allows the establishment of a base line for further studies.

Another goal was to determine the ability of 30 m interval shovel test transects to locate all of the archaeological resources on a given tract. Since very few of the survey areas are exposed, theoretically speaking, it provided us with data that may be used in comparison to previous surveys where surface visibility was excellent. This data may assist in defining issues concerning the ability to identify and spatially define sites that have been recovered through traditional survey methods.

Since the study area is thought to contain a large quantity of prehistoric lithic sites, analysis was geared toward determining lithic resource preference changes through time. Both quartz river cobbles and metavolcanic materials were locally available, although river cobbles could be obtained within the boundaries of Fort Bragg and metavolcanics were known to outcrop as close as 16 km away (North Carolina Department of Conservation and Development 1958).

Another goal was to determine site function/duration based on artifact content. Sassaman et al. (1990) have suggested that examining the tool to debitage ratio can provide functional information about a site. For instance, a low tool-debitage ratio will reflect either "locations of intensive lithic tool production, or locations where tools or cores were modified but not discarded" (Sassaman et al. 1990:224). A high tool-debitage ratio correspond to "relatively

intensively utilized locations (e.g. field stations) away from bases and/or sources of lithic raw material" (Sassaman et al. 1990:224). Artifact density is also a method of examining site function since it reflects the "relative intensity of material discard at a site. By extension, the amount of discard is assumed to be proportional to the cumulative duration of site occupation and/or the total number of site occupants, and/or the intensity of activities from which discarded debris was generated" (Sassaman et al. 1990:223). Diversity of the assemblage can also measure the length of occupation since the discard rate of curated items (such as hafted bifaces, pots, atlatls, etc.) is so low that all classes of artifacts will only be found together at sites with long occupational histories (Sassaman et al. 1990:224). This length of occupation can also be measured by the number of components present (Sassaman et al. 1990).

All of these (tool/debitage ratio, artifact density, and artifact diversity) are tools to examine the nature of an archaeological site in terms of function and duration of occupation. While Sassaman et al. (1990) recommend looking at large subsurface data sets, examining the materials from the project areas, which were typically all gathered from the surface using the methods previously described, may provide a reference point for framing future research questions.

Archival Research

These investigations incorporated a review of the site files at the North Carolina Office of State Archaeology. Nine previously recorded archaeological sites were recorded within the survey boundaries of the Holland Drop Zone survey tract by Loftfield (1979) as part of a reconnaissance level survey of Fort Bragg, Camp Mackall, and Simmons Airfield. No sites were previously recorded within the survey boundaries of the Fort Bragg general survey tracts. According to Fort Bragg's historic preservation plan (Braley 1990) no standing structures exist on the tracts and the nearest structure or site listed on the National Register of Historic Places is Long Street Church (ca. 1845) which is located approximately 21 km east of the Holland Drop Zone survey tract. Another notable site is Monroe's Crossroads which was located about 13 km east of the Holland Drop Zone survey tract. Here a skirmish between Wheeler's cavalry and a detachment of General Sherman's troops under the command of General H. Judson Kilpatrick occurred at the end of the Civil War in March of 1865 (Loftfield 1979:27). At Monroe's Crossroads were two plantations: Rocky Mount and Green Springs. Loftfield (1979:28) recommended that this area receive further study for possible National Register nomination (see the **Prehistoric and Historic Overview** section of this report).

Field Survey

As is often the case in field investigations, some boundaries of the survey tracts were difficult to locate in the field or were somewhat nebulous. Even 7.5' USGS topographic maps fail to show all the detail and complexity of land forms. Added to this is the nature of a landscape actively used by the military. Consequently, project boundaries were driven with the base archaeologist, Mr. Wayne Boyko. This was particularly important in survey tracts "A," where some of the boundaries were not determined by firebreaks and access roads.

As specified by the North Carolina Office of State Archaeology, an archaeological site is defined as six or more artifacts in a 20 m area or any two consecutive positive shovel tests. An isolated occurrence, based on the National Park Service scope of work for the project, consists of five or less artifacts. Both archaeological sites and occurrences were assigned state site numbers.

According to the scope of work, subsurface testing, for the purpose of boundary definitions, was to consist of testing along cardinal directions at 10 m intervals on sites less than 50 m across and at 20 m intervals on larger sites. In an effort to create a uniform grid over the site which combines the data between the survey transect and site delimitation units, testing may also be conducted at 15 m intervals.

Typically survey tracts are divided into high, medium, and low archaeological probability zones. For instance, the estimated prehistoric site

density for all of Fort Bragg is 10 sites per km^2 (Braley 1990:22). Although Loftfield's (1979) study revealed that the Holland Drop Zone had a low density of prehistoric archaeological resources (1.4 sites per km^2) compared to other areas of Fort Bragg, the work order issued by the National Park Service specified that the entire survey area was considered high probability given the sparsity of research in the area and the dense vegetation found on similar landforms.

Although all tracts within the Fort Bragg general survey areas were wooded, certain tracts were considered high probability whereas others were considered low probability. Other than survey tract "B," those tracts within the Fort Bragg cantonment area were considered low probability.

The scope of work specified that low probability surveys include transects and shovel tests spaced at 50 m intervals across the tract. High probability surveys included transects and shovel tests spaced at 30 m intervals across the tract. All areas were to be shovel tested except areas of standing water or with 10% or greater slope.

Shovel tests, which were typically 30 cm by 30 cm or greater, were to be excavated to subsoil or if subsoil could not be identified to the maximum depth achievable with a shovel (about 75 cm). Minimally, shovel tests were excavated to about 30 cm below surface. As will be discussed, in most cases this represented either the extent of remaining A horizon soil or actual penetration into the C horizon subsoils. The fill was to be screened through 0.62 cm mesh hardware cloth and soil stratigraphy was to be recorded on positive shovel tests.

Survey transects were plotted and numbered on project field maps (Figures 27 through 29) and transect logs were kept indicating if a shovel test was excavated or if the area was surface collected. A total of 264 transects were traversed and a total of 7,306 shovel test stations (shovel tests/surface survey) were used. Of the 7,306 shovel test stations 1,037 (or 14%) consisted of shovel tests and the remaining 6,269 were either surface surveyed or fell on a slope.

As the site maps in the following report section are examined, it will become obvious that on occasion a positive surface collection station will appear to be located *outside* of the site boundaries. While this may at first appear to be an error in the location of site boundaries, it is not. When required, each surface collection station was based on the transect grid. These were used to form a 30 m grid collection square. In order to refine boundaries as much as possible, the materials from these areas were not randomly collected. Instead, the grid square was walked and the artifacts were flagged. This allowed site boundaries to be drawn on the basis of where in the collection area artifacts were actually found. This means that while the actual center point of the collection station may be shown "outside" the site boundaries, if you draw a 30 meter square around the center point, the portion within the drawn site boundaries actually produced artifacts. The rest of the collection area did not contain artifacts and was therefore excluded from the site. The goal here, of course, was to as much as possible replicate the precision offered by multiple shovel tests.

A rough determination of site size, typically based on the distribution of surface artifacts, was made before closer interval testing based on findings from the 30 m or 50 m transects. Shovel tests were to be excavated until two consecutive negative tests were encountered around each positive test. The last shovel test in the sequence containing archaeological materials was to constitute a boundary.

On the Holland Drop Zone survey tract, at non-isolated occurrences, there are a number of cases (31HK561, 31HK562, 31HK564, 31HK566, 31HK570, 31HK573, 31HK577, 31HK585, 31HK589, and 31HK591) where although surface remains were apparent, no subsurface remains were encountered during shovel testing. Initially all boundaries were defined by the extent of surface remains. In only three cases (31HK23, 31HK563 and 31HK568) were the site boundaries defined and extended by a combination of surface collections and positive shovel test stations.

One 50 by 50 cm test was to be excavated

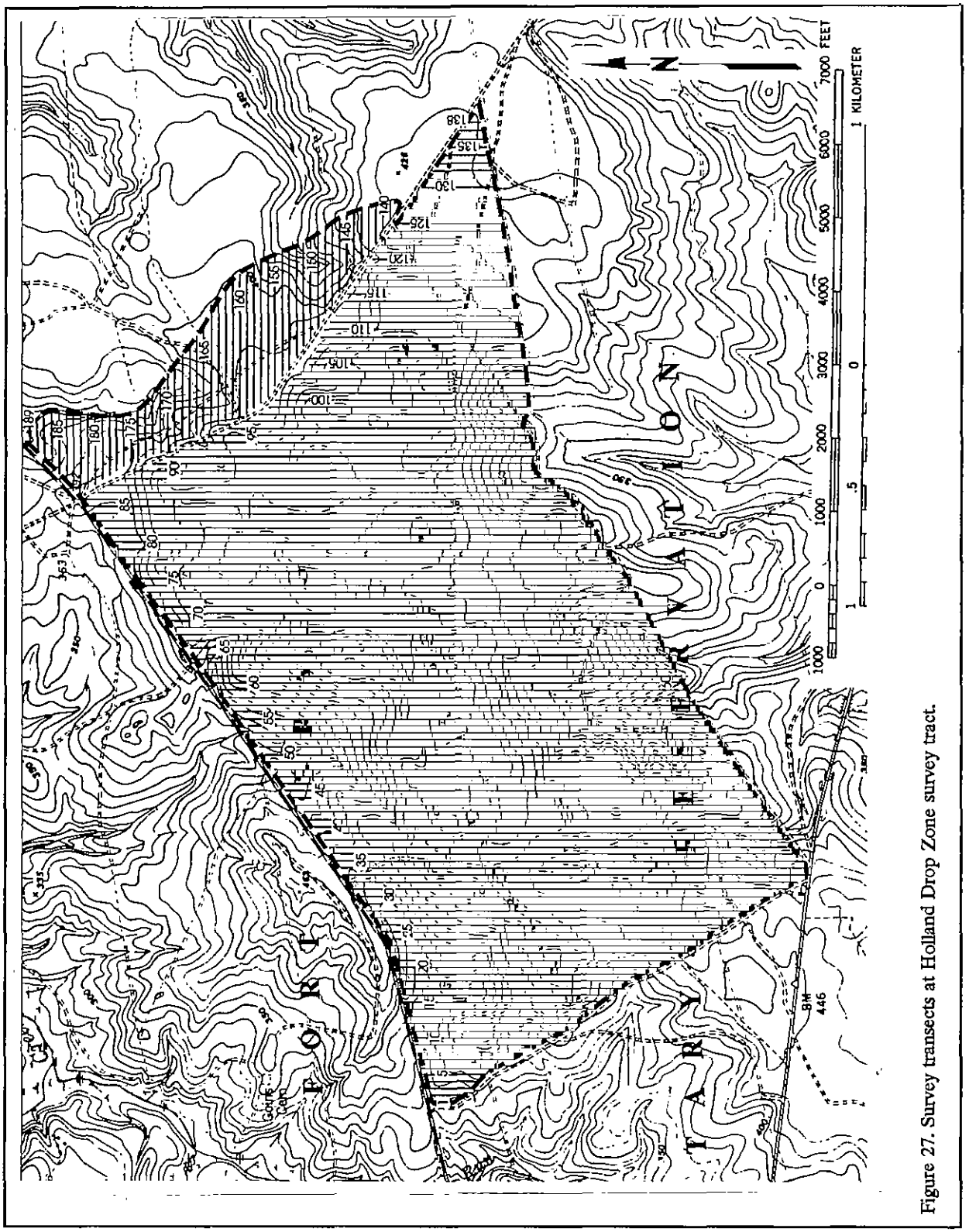

Figure 27. Survey transects at Holland Drop Zone survey tract.

Figure 28. Survey tracts at Fort Bragg general survey tracts "A" and "C".

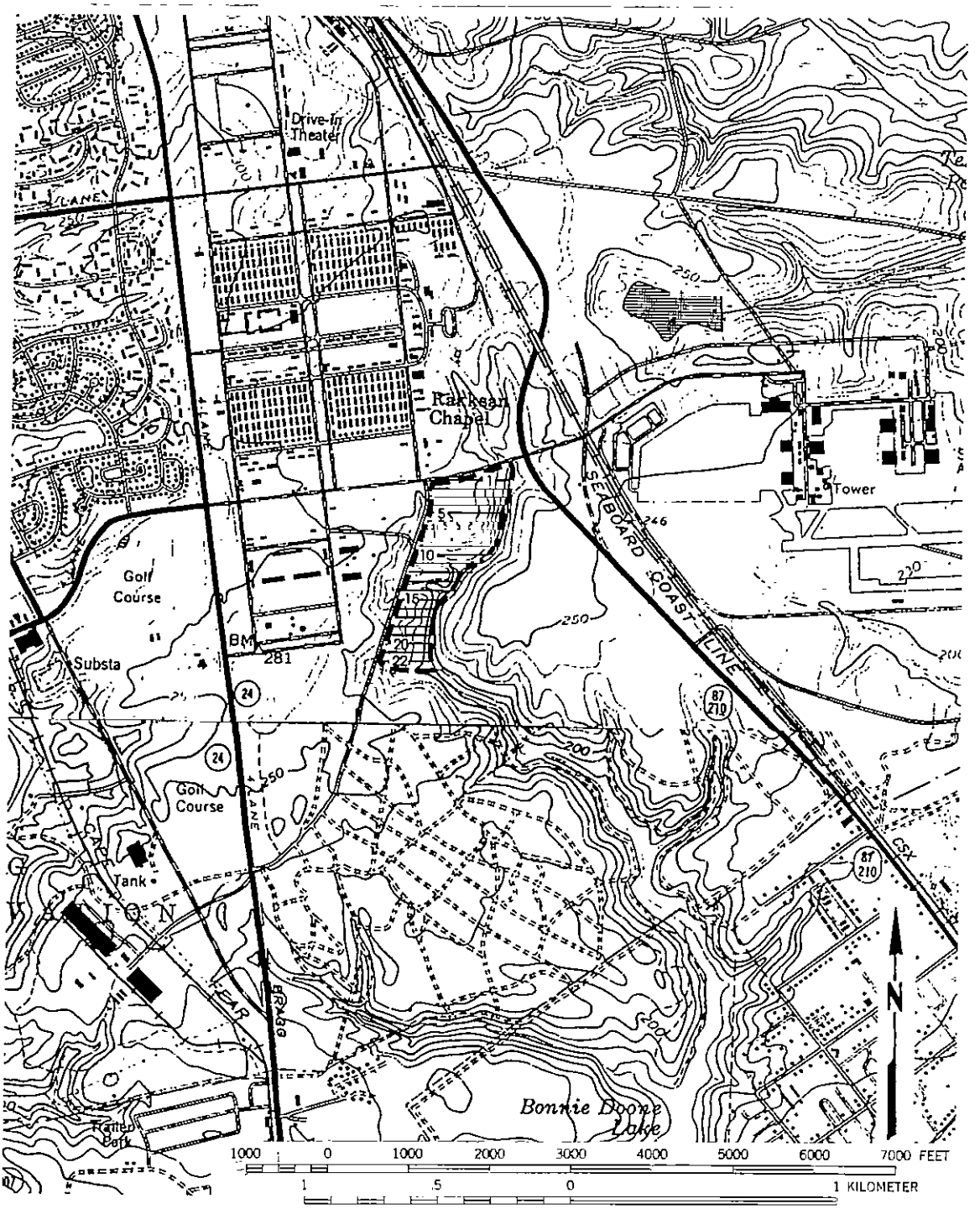

Figure 29. Survey transects at Fort Bragg general survey tract "B".

at each *site* to subsoil or a minimum of 100 cm (assuming subsoil was not reached). Profiles were to be drawn to scale and soil was to be described using a Munsell Soil Color designation. Photographs were to be taken using black and white and color transparency film.

At each *site,* a sketch map was to be drawn to scale showing the locations of shovel tests, test units, natural and man-made features, and datums. In addition, GPS positions were to be taken at all sites, and at each potentially eligible or eligible *site* a metal datum was to be established.

The GPS positions were taken with a Trimble GeoExplorer™ rover with *at least* one position recorded. Where possible, additional positions were taken since averaging provides some improvement on accuracy. These positions record the latitude, longitude, and altitude of a point. Prior to correction these positions resemble a scatter of points; affected by what is called selective availability (S/A). This is the deliberate introduction of errors into the GPS measurements by the Department of Defense.

GPS readings taken with S/A active can be corrected by comparing it to data collected simultaneously at a known location or base station. Called differential correction (or DGPS), this was undertaken with the Fort Bragg data as postprocessing. With correction, this scatter of points is consolidated to form a single position where the theoretical accuracy may be ±5 m.

The critical parameters used by the Chicora rover attempted to maximize both data quality and quantity, using the Trimble recommended default settings (for example, the PDOP mask, which is an indication of the accuracy of the GPS positions which are calculated, is set at 6, with PDOPs below 4 being excellent and above 8 being poor). Although at least 200 positions were recorded at each site location during the current survey, problems with consolidation were encountered during postprocessing. This problem was discussed with Mark Jones, LCTA Coordinator. Although unable to isolate the problem of non-consolidation, he has suggested that the problems "may be caused by an incompatible setting on either the Base Station or

Table 2.
UTM Coordinates for Sites in the Holland Drop Zone Survey Tract Using GPS with Selective Availability

	Position	GPS		Map Interpolation	
Site#	Recorded	N	E	N	E
31HK23*	200	NR	NR	3891760	656995
31HK550*	200	NR	NR	3891480	654300
31HK551*	200	NR	NR	3891315	654340
31HK552*	200	3891308	654313	3891320	654330
31HK553*	200	NR	NR	3891580	654360
31HK554*	200	3891370	654468	3890950	654400
31HK555*	200	3891365	654465	3891590	654520
31HK556*	200	3891614	654587	3891700	654600
31HK557*	200	3891527	654605	3891640	654700
31HK558*	200	3890982	654805	3891520	654800
31HK559*	200	3891229	654809	3891200	654790
31HK560*	200	3891299	654971	3891265	654960
31HK561*	200	3890981	654810	3890555	654995
31HK562*	200	3890870	655098	3890770	654995
31HK563*	200	3890872	655099	3890920	654995
31HK564*	200	3891734	655188	3891830	655030
31HK565*	200	3891733	655190	3891730	655210
31HK566*	200	3891989	655207	3892040	655280
31HK567*	200	3891824	655241	3891840	655380
31HK568*	200	3892292	655208	3892290	655350
31HK569*	200	3892363	655269	3892580	655460
31HK570*	200	3891848	655434	3892080	655430
31HK571*	200	3892007	655378	3892200	655500
31HK572*	200	3892258	655513	3892500	655650
31HK573*	200	NR	NR	3892665	655435
31HK574*	200	3892330	655926	3892480	656085
31HK575*	200	3892482	655864	3892700	656060
31HK576*	200	3892746	655925	3892940	656140
31HK577*	200	3891617	656139	3891760	656160
31HK578*	200	3891424	656138	3891690	656115
31HK579*	200	3891574	656311	3891560	656415
31HK580*	200	3891928	656367	3892115	656540
31HK581*	200	3892041	656403	3891520	656520
31HK582*	200	3891770	656442	3891790	656535
31HK583*	200	3892198	656542	3891710	656645
31HK584*	200	NR	NR	3891640	656660
31HK585*	200	3892208	656624	3892020	656760
31HK586*	200	3891778	656683	3891560	656770
31HK587*	200	3891909	656687	3891680	656780
31HK588*	200	3891876	656715	3891740	656810
31HK589*	200	3892600	656506	3892290	656740
31HK591*	200	NR	NR	3892820	656200
31HK592*	200	3892506	656345	3892000	656560

NR = no reading obtained by GPS

on the Rover Unit" (Mark Jones, personal communication 1996). Fortunately the data was still useful in this raw form. Central positions at the sites were determined from the scatter of positions recorded (Table 2). To eliminate any future problems all GPS collection conducted at Fort Bragg will be coordinated through the LCTA Coordinator to ensure compatibility, as well as proper settings for the two units to interact prior to recordation in the field.

The only other changes we can immediately identify which might improve the quality of the DGPS data would be to schedule data collection times and satellites being used based on their almanac files in order to maximize precision. This, however, is a time consuming technique and also requires that field survey be scheduled around GPS data acquisition, which is not cost-effective. Consequently, we recommend that reliance continue to be placed on map interpolation as the primary site location technique.

With this in mind, UTMs were also hand plotted. These positions are provided in Table 2. Comparing the DGPS and interpolated map coordinates reveal significant differences. While there are certainly problems recording positions in the woods, as any archaeologist will affirm, the interpolated positions have high levels of confidence since they are based on topographic features, distances and bearings to landmarks, and placement within well identified transects. In all cases the hand plotted UTMs are considerably more accurate than the DGPS coordinates.

Datums at potentially eligible sites consisted of a length of iron rebar with approximately 5 cm exposed above ground. An aluminum cap marked with the temporary site number was placed on top of the rebar. Permanent site numbers could not be used on the site datums since they had not yet been assigned by the North Carolina Office of State Archaeology.

No deviations from the original methodology described in the Scope of Work (other than those discussed above) occurred during the field work. No other unusual or expected problems occurred during the study which affects the quality of the data.

Laboratory Methods

The washing and cleaning of artifacts and cataloging of the specimens was conducted during rain days in the field and completed at Chicora laboratories in Columbia in late December 1996. The materials will be curated at Fort Bragg and have been cataloged using that institution's accessioning practices. All processing and labeling of artifacts follow procedures and standards defined by the North Carolina Office of State Archaeology (see Archaeological Curation Standards and Guidelines, 1995 revised). Table 3 provides a list of permanent site numbers and their corresponding accession numbers as assigned by the North Carolina Office of State Archaeology. No specimens were identified which required conservation or stabilization. Specimens were packed in plastic bags and boxed. Field notes were prepared on pH neutral, alkaline buffered paper and photographic materials were processed to archival standards. All field notes, with archival copies, will also be curated with this facility.

Analysis methods focused on occupation spans, likely functions of the various sites, and changes in raw material preferences. For those sites which were prehistoric, diagnostic lithics and/or ceramics provided temporal information. The diagnostic lithic remains were compared to published typological descriptions for the various projectile points such as Coe (1952, 1964), Oliver (1981), and South (1959).

Two primary materials were identified in the lithic collections. One was quartz, which was usually a translucent white, but occasionally reddish, grayish, yellowish-brown, or clear. This material is found throughout the Carolina Piedmont and might have been obtained from either veins or as cobbles in Piedmont river gravels. The other common material was classified simply as metavolcanic, meaning partially metamorphosed volcanic rocks. This might include chert, flow banded rhyolite, porphyritic rhyolite, plain rhyolite, felsic tuff, welded vitric tuff or breccia tuff.

Debitage categories included primary (defined as flakes with 90% or more cortex), secondary (defined as having 1% to 90% cortex), interior (defined as having no cortex). These categories, widely used, are briefly explained by Yohe (1996:54-56). More refined categories, where they are used, follow the definitions offered by Blanton et al. (1986), Oliver et al. (1986), and Yohe (1996).

Table 3
Correlation of accession numbers with site numbers

Site No.	Acc. No.	Site No.	Acc. No.	Site No.	Acc. No.
31HK550	96417	31HK565	96430	31HK580	96445
31HK551	96418	31HK566	96431	31HK581	96446
31HK552	96419	31HK567	96432	31HK582	96447
31HK553	96420	31HK568	96433	31HK583	96448
31HK554	96421	31HK569	96434	31HK584	96449
31HK555	96422	31HK570	96435	31HK585	96450
31HK556	96423	31HK571	96436	31HK586	96451
31HK557	96424	31HK572	96437	31HK587	96452
31HK558	96425	31HK573	96438	31HK588	96453
31HK559	96426	31HK574	96439	31HK589	96454
31HK560	96427	31HK575	96440	31HK590	96455
31HK561	96428	31HK576	96441	31HK591	96456
31HK562	96429	31HK577	96442	31HK592	96457
31HK563	96458	31HK578	96443		
31HK564	96459	31HK579	96445		

At the survey level tools are defined very simply, being placed in broad morphological categories. Our laboratory methods, for example, define a biface as an artifact with flakes removed on both sides (not distinguishing between preforms, early stage reductions, and so forth); a core is a piece of raw material from which flakes have been removed; an end scraper is a blade tool with at least one convex end which exhibits a steep angle; a used flake is a chip of stone that was used as a tool, exhibiting edge damage or wear; and a side scraper is a flake tool in which one of the long edges was retouched to serve as the scraping edge. These definitions generally follow those provided by Yohe (1996).

Pottery examples were compared to typological descriptions provided by Coe (1964), Loftfield (1976), and South (1959) for the south coastal region and the North Carolina Piedmont. They were also compared to the type descriptions offered by Phelps (1983) for the north coastal region.

Analysis of the historic collections follow professionally accepted standards with a level of suitability to the quantity and quality of the remains. In general, the temporal, cultural, and typological classifications of historic remains follow such authors as Cushion (1976), Godden (1964, 1985), Miller (1980, 1991), Noël Hume (1978), Norman-Wilcox (1965), Peirce (1988), Price (1970), South (1977), and Walton (1976). Glass artifacts are identified using sources such as Jones (1986), Jones and Sullivan (1985), McKearin and McKearin (1972), McNally (1982), and Vose (1975). Sutton and Arkush (1996) provide an excellent overview of a broad range of other historic material, although primary sources will typically be provided in the text if the remains require a more detailed analysis.

RESULTS OF SURVEY

Introduction

The cultural resources identified during the intensive survey of the 625.73 ha Holland Drop Zone survey tract at Fort Bragg consist of 43 prehistoric archaeological sites which included 31 isolated occurrences (Table 4). No historical sites were encountered. None of the isolated occurrences are recommended as eligible for inclusion on the National Register of Historic Places, although one site, 31HK23, is recommended as potentially eligible.

During the intensive survey of the 243.81 ha Fort Bragg general survey tracts no prehistoric or historic cultural resources were identified.

Table 4.
Archaeological Sites Identified at Holland Drop Zone and Fort Bragg

Site Number	Components	Artifacts	Size (m²)	Quadrangle	Eligibility
	Holland Drop Zone Area Survey				
31HK23*	Lithic/Archaic	2,042	26,100	Niagara	PE
31HK550*	Isolated lithic	1	1	Niagara	NE
31HK551*	Isolated lithic/Archaic	1	2	Niagara	NE
31HK552*	Isolated lithic	1	1	Niagara	NE
31HK553*	Isolated lithic	1	1	Niagara	NE
31HK554*	Isolated lithic	2	1	Niagara	NE
31HK555*	Isolated lithic	4	225	Niagara	NE
31HK556*	Isolated lithic	4	675	Niagara	NE
31HK557*	Isolated lithic	1	1	Niagara	NE
31HK558*	Isolated lithic	1	1	Niagara	NE
31HK559*	Isolated lithic	3	100	Niagara	NE
31HK560*	Isolated lithic	1	1	Niagara	NE
31HK561*	Lithic/Woodland	158	3,375	Niagara	NE
31HK562*	Lithic/Archaic/Woodland	49	3,500	Niagara	NE
31HK563*	Lithic	271	17,600	Niagara	NE
31HK564*	Lithic/Woodland	39	1,800	Niagara	NE
31HK565*	Isolated lithic	4	88	Niagara	NE
31HK566*	Lithic/Archaic/Woodland	37	1,500	Niagara	NE
31HK567*	Isolated lithic	2	100	Niagara	NE
31HK568*	Lithic	34	3,575	Niagara	NE
31HK569*	Isolated lithic	3	1	Niagara	NE
31HK570*	Lithic	39	7,000	Niagara	NE
31HK571*	Isolated lithic	1	1	Niagara	NE
31HK572*	Isolated lithic/Woodland	3	25	Niagara	NE
31HK573*	Lithic/Archaic	66	600	Niagara	NE
31HK574*	Isolated lithic	2	25	Niagara	NE
31HK575*	Isolated lithic	4	200	Niagara	NE
31HK576*	Isolated lithic	4	250	Niagara	NE
31HK577*	Lithic	7	25	Niagara	NE
31HK578*	Isolated lithic	1	1	Niagara	NE
31HK579*	Isolated lithic	1	1	Niagara	NE
31HK580*	Isolated lithic/Woodland	1	1	Niagara	NE
31HK581*	Isolated lithic	1	1	Niagara	NE
31HK582*	Isolated lithic	4	700	Niagara	NE
31HK583*	Isolated lithic	3	525	Niagara	NE
31HK584*	Isolated lithic	1	1	Niagara	NE
31HK585*	Lithic	10	1,400	Niagara	NE
31HK586*	Isolated lithic	4	75	Niagara	NE
31HK587*	Isolated lithic	1	1	Niagara	NE
31HK588*	Isolated lithic	1	1	Niagara	NE
31HK589*	Isolated lithic	4	75	Niagara	NE
31HK591*	Lithic	19	1,575	Niagara	NE
31HK592*	Isolated lithic	2	1	Niagara	NE

PE = potentially eligible for inclusion on the National Register; NE = not eligible for inclusion on the National Register

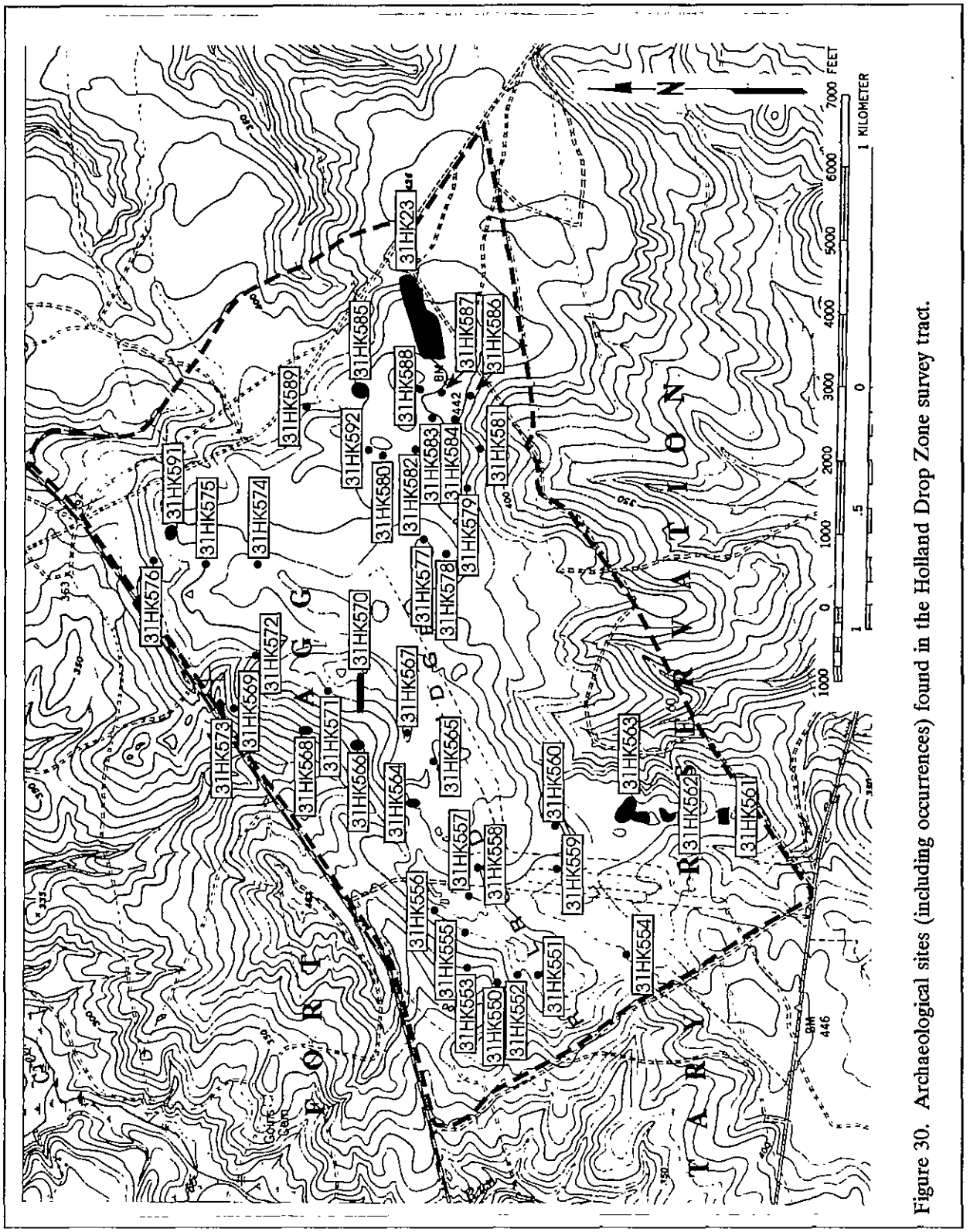

Figure 30. Archaeological sites (including occurrences) found in the Holland Drop Zone survey tract.

Prehistoric sites, by convention of the North Carolina Office of State Archaeology are designated by an asterisk (*) following the site number. Historic sites are designated by two asterisks (**) following the site number.

Revisited Archaeological Sites

31HK23*

Site 31HK23* is located 240 m east of the intersection of Longstreet Road and Manchester Road. It is also 430 m south of Manchester Road down the eastern Holland Drop Zone boundary road. The northwestern drainage of Piney Bottom Creek is located approximately 1,000 m southeast of the site. The central UTM coordinates are N3891760 E656995. This site is located on an upland eastern facing slope. The elevation at the site is 137 m above mean sea level and, based on the surface collection, the site measures approximately 360 m east-west by 150 m north-south. The site covered an area approximately 26,100 m^2 in size (Figure 30).

The site was originally identified by Loftfield (1979:G-5) who surfaced collected 198 artifacts. These included one projectile point midsection; one endscraper; one scraper; one biface fragment; three core fragments; 19 grit tempered, net impressed pottery sherds; and 171 flakes. The site was identified as an Early Archaic to Woodland Period prehistoric site. No subsurface testing was done and further testing was recommended to evaluate the site's eligibility for inclusion on the National Register.

Vegetation at the site is nonexistent except for the northern and eastern edges. This allowed near 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially found on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 52,200 m^2. The surface collection recovered a total of 1,888 artifacts (not including raw material and shatter), while subsurface testing yielded only four artifacts.

The materials from the collection units are itemized in Table 5. The majority of the collection represents flakes (n=1865, 98.8%), with quartz dominating the assemblage (n=1613, 86.5%). A small quantity of tools were present in the assemblage, including three projectile points, 11 bifaces or biface fragments, one preform, three scrapers, and five used flakes.

Collection Unit 4 produced one metavolcanic Kirk Serrated projectile point, measuring 37.05 mm in length, 18.74 mm in width, and 4.74 mm in thickness. Another Kirk Serrated point, made of quartz, was recovered from Collection Unit 61. This specimen measures 36.55 mm in length, 22.48 mm in width, and 8.36 mm in thickness. The final projectile point, a metavolcanic Morrow Mountain point (classified by some researchers as a Morrow Mountain II), was recovered from Collection Unit 55. Its length is 37.15 mm, the width is 20.79 mm, and the thickness is 8.84 mm.

The quartz preform is well knapped and measures 37.16 mm in length, 49.12 mm in maximum width, and 19.25 mm in width. The measurements for the three intact bifaces are itemized in Table 6, while measurements for the three scrapers are shown in Table 7.

Using ST14 on T107 as a base point, designated N200E200, an additional 246 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. Only two test units, N155E485 and N215E245), produced artifacts — one interior metavolcanic flake from the former and one interior quartz flake from the latter. All shovel tests were excavated to depths ranging from 5 to 75 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts. Excavated to a depth of 30 cm, a total of two interior quartz flakes were recovered from this unit at a depth of 0 to 10 cm. The test unit soil profile consisted of 30 cm of strong brown (7.5YR 5/6) sand. The soils are classified as

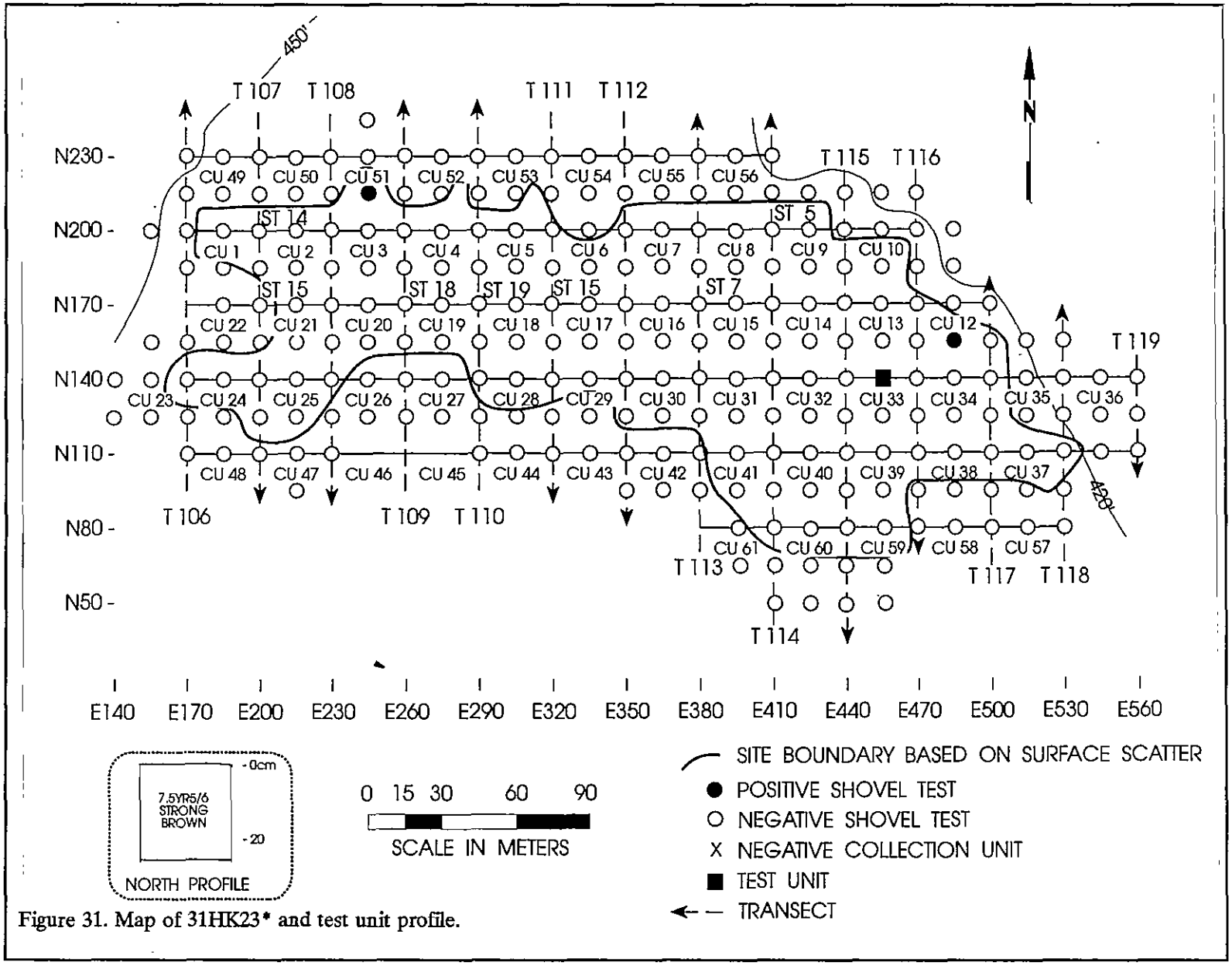

Figure 31. Map of 31HK23* and test unit profile.

Table 5.
Artifacts Collected from 31HK23*

Coll Unit	Kirk Serr	Morrow Mt. II	Biface Q	Biface M	Quartz Scraper	Quartz Preform	Used Flakes Q	Used Flakes M	Metavol. Flakes P	Metavol. Flakes S	Metavol. Flakes I	Quartz. Flakes P	Quartz. Flakes S	Quartz. Flakes I	Raw Mat Q	Raw Mat M	Q Sh
1											3			1			
2											2			1			3
3														2			5
4	1													2			1
5			1											6			
6			2		1						1			140			33
7											1			28			
8											1			2			
9														12			
10											2			27			4
12				1							13			35			
13							2				10			118			22
14					2	1					2			37			3
15											1			1			3
16											3	1		22			3
17			2				1				10		1	227			10
18								1			15			37			1
19											4						1
20											26			4			
21											21			2			2
23											3						
24											13						3
25				2							22			2			
26											7			3			1
28											2			32			1
29											2			5			
30											5			3			
32											5			57		1	5
33							1				26			264			23
34			1								9			81			
35											1			9			
37											2			3			
38											9		1	64			
39			1								15			252			23
40			1								6	2		57	1		
41											1						
49											3						
50											3						
51														2			
52														1			
53											1			3			
55		1															
56											1			9			
57																	1
59											1			47			
60														10			
61	1																

Q = quartz, M = metavolcanic, P= primary, S = secondary, I = interior, Sh = Shatter

Candor sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

Although no diagnostic subsurface artifacts were found, three were recovered from the surface. These include two Kirk Serrated projectile points, and a Morrow Mountain II projectile point. These are indicative of an Archaic period occupation, consistent with the nature of the scrapers and other remains from the site.

Table 6.
Measurements (in mm) for Intact Bifaces from 31HK23*

Collection Unit	Material	Length	Width	Thickness
5	quartz	18.23	28.84	8.98
12	metavolcanic	28.65	49.12	19.25
34	quartz	25.35	34.94	7.60

Site assessment is difficult. There seems to be ample evidence that this site, like the others in this survey, has been dramatically affected by soil loss. Nevertheless, the quantity of remains present is very impressive, especially in light of the other sites in this general survey area. In addition, there seems to be a marked preference for quartz at this site, a feature which in itself deserves further investigation. Consequently, we recommend

Table 7.
Measurements (in mm) of Scrapers from 31HK23*

Collection Unit	material	length	width	thickness	angle
6	quartz	22.76	22.05	9.63	70°
14	quartz	27.56	22.70	13.86	61°
14	quartz	21.99	22.46	8.20	85°

31HK23* as potentially eligible for inclusion on the National Register of Historic Places.

Additional testing at the site should focus on several issues. Paramount is whether any areas of intact subsurface remains can be identified. Based on the available surface collection density data, we recommend that additional testing be conducted at 5 meter intervals in those areas of densest remains. If intact soil zones can be identified, it may be appropriate to conduct block excavations.

Newly Identified Archaeological Sites

31HK561*

Site 31HK561* is located 1,320 m east of the intersection of Fire Break Road 24 and Manchester Road. It is also 1,560 m south of Manchester Road. The northwestern drainage of Piney Bottom Creek is located 1,000 m southeast of the site. The central UTM coordinates are N3890555 E654995. This site is located on an upland eastern facing slope. The elevation at the site is 113 m above mean sea level and, based on the surface collection, the site measures about 75 m east-west by 45 m north-south making the site approximately 3,375 m^2 in size (Figure 31).

Vegetation at the site is a combination of new growth field grass, which allowed approximately 50% visibility, to the west and mixed hardwoods and pines with a scrub oak understory, which allowed approximately 75% visibility to the east. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 5,400 m^2. The surface collection recovered a total of 154 artifacts and subsurface testing yielded four artifacts. Collection Unit 1 yielded 31 artifacts. These included six interior metavolcanic flakes, one metavolcanic burin, one metavolcanic Savannah River Stemmed projectile point base (Coe 1964:44), 22 interior quartz flakes, and one quartz shatter. The Savannah River Stemmed point is 86.50 mm in length, 55.96 mm in width, 11.96 mm in thickness with a basal width of 24.02 mm. Collection Unit 2 contained a total of four artifacts. These included three interior metavolcanic flakes and one interior quartz flake. Collection Unit 3 contained a total of 45 artifacts. These included 41 interior metavolcanic flakes and four interior quartz flakes. Collection Unit 4 contained a total of 20 artifacts. These included nine interior metavolcanic flakes, nine interior quartz flakes, and two fragments of quartz shatter. Collection Unit 5 contained a total of four artifacts. These included two interior metavolcanic flakes and two interior quartz flakes. Collection Unit 6 contained a total of 28 artifacts. These included one interior metavolcanic flake, 26 interior quartz flakes, and one secondary quartz flake.

Using ST5 on T44 as a base point, designated N200E200, an additional 44 shovel tests

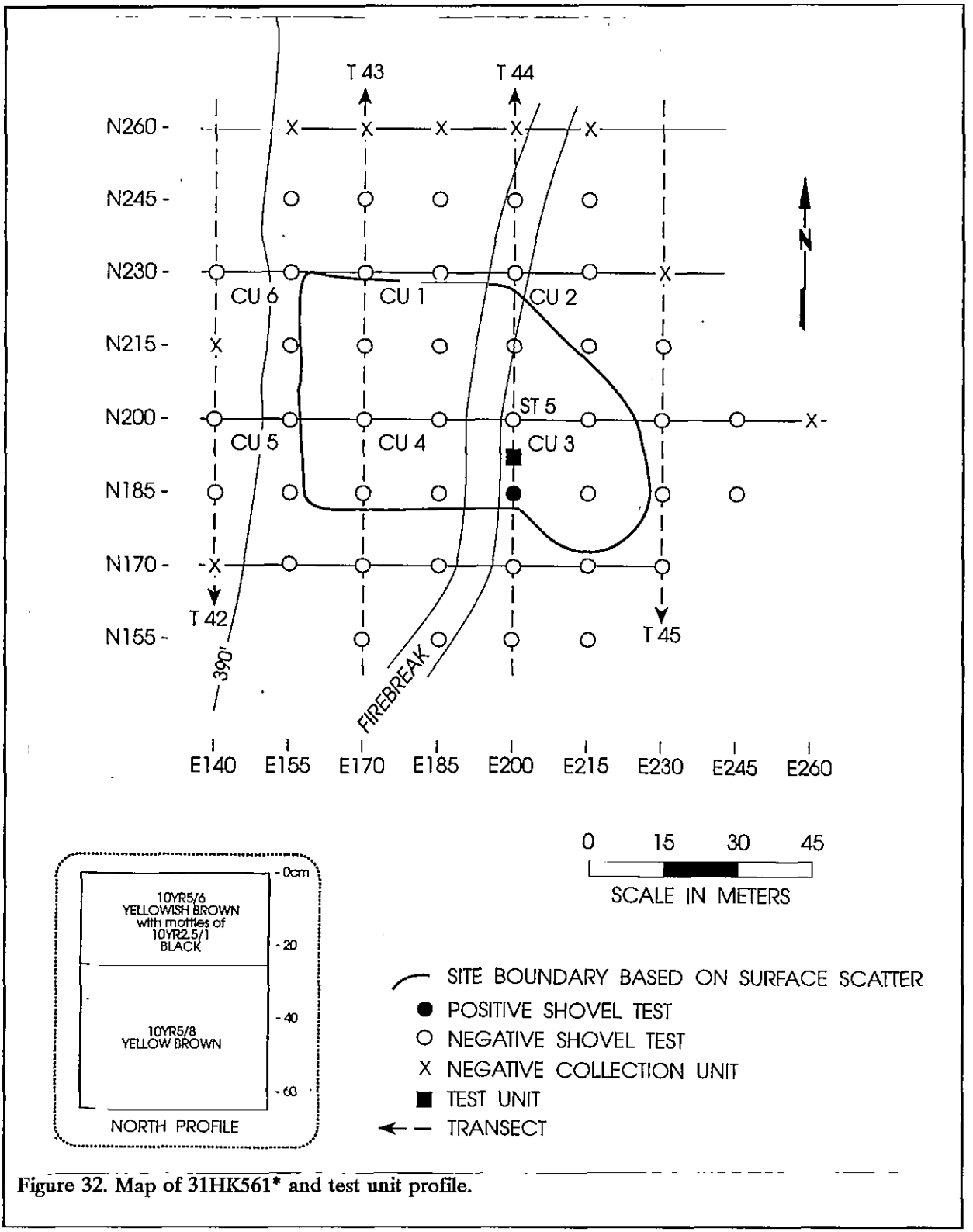

Figure 32. Map of 31HK561* and test unit profile.

were excavated in a cardinal grid pattern at 15 m intervals. Only one test unit, N185E200, produced artifacts — two interior metavolcanic flakes. All shovel tests were excavated to depths ranging from 20 to 75 cm below surface. It is evident from the soil profile that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts. Excavated to a depth of 70 cm, a total of two artifacts were recovered from this unit. These included one interior quartz flake from 10 to 20 cm in depth and one interior quartz flake from the 40 to 50 cm level. The test unit soil profile consisted of 25 cm of yellowish brown (10YR 5/6) sand with black (10YR 2.5/1) mottles, overlying 45 cm of yellowish brown (10YR 5/8) sand. The soils are classified as Candor sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

Only one diagnostic artifact, a Savannah River Stemmed projectile point, was recovered from this site. While able to provide information on temporal placement it seems unlikely that the assemblage exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Even though subsurface remains were recovered, soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK561* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK562*

Site 31HK562* is located 1,320 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also 1,350 m south of Manchester Road. The northwestern drainage of Piney Bottom Creek is located 1,210 m southeast of the site. The central UTM coordinates are N3890770 E654995. This site is located on an upland eastern facing slope. The elevation at the site is 111 m above mean sea level and, based on the surface collection, the site measures about 50 m east-west by 70 m north-south making the site approximately 3,500 m^2 in size (Figure 32).

Vegetation at the site is a combination of new growth field grass, which allowed approximately 65% visibility, to the west and mixed hardwoods and pines with a scrub oak understory, which allowed approximately 75% visibility to the east. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total area of 5,400 m^2. The surface collection recovered a total of 49 artifacts. No artifacts were recovered during subsurface testing. Collection Unit 1 yielded 15 artifacts. These included five interior metavolcanic flakes, one chert Small Savannah River Stemmed (Oliver 1981:151) projectile point base, one interior quartz flake, two Yadkin Fabric-Impressed (Coe 1964:30-32) rim sherds (4.20g) and six small sherds (17.33g). The measurements for the Small Savannah River Stemmed projectile point are 35.66 mm in length, 21.86 mm in width, 11.17 mm thick, with a basal width of 12.25 mm. Collection Unit 2 contained a total of 15 artifacts. These included four interior metavolcanic flakes, three interior quartz flakes, one large eroded sherd (21.60g), and seven small sherds (22.26g). Collection Unit 3 contained no artifacts. Collection Unit 4 contained a total of three artifacts. These included one interior quartz flake, one quartz raw material (28.17g), and one small sherd (2.85g). Collection Unit 5 contained a total of 12 artifacts. These included one metavolcanic Guilford Lanceolate projectile point (Coe 1964:43), one quartz interior flake, one quartz raw material (33.94g), and nine Yadkin Fabric-Impressed (Coe 1964:30-32) sherds (28.25g). The measurements for the Guilford projectile point are 50.00 mm in length, 21.31 mm in width, and 8.29 mm in thickness. Collection Unit 6 contained a total of three artifacts. These included two interior metavolcanic flakes and one interior quartz flake.

Using ST12 on T44 as a base point, designated N200E200, an additional 35 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. None yielded any additional artifacts. All shovel tests were excavated to depths ranging

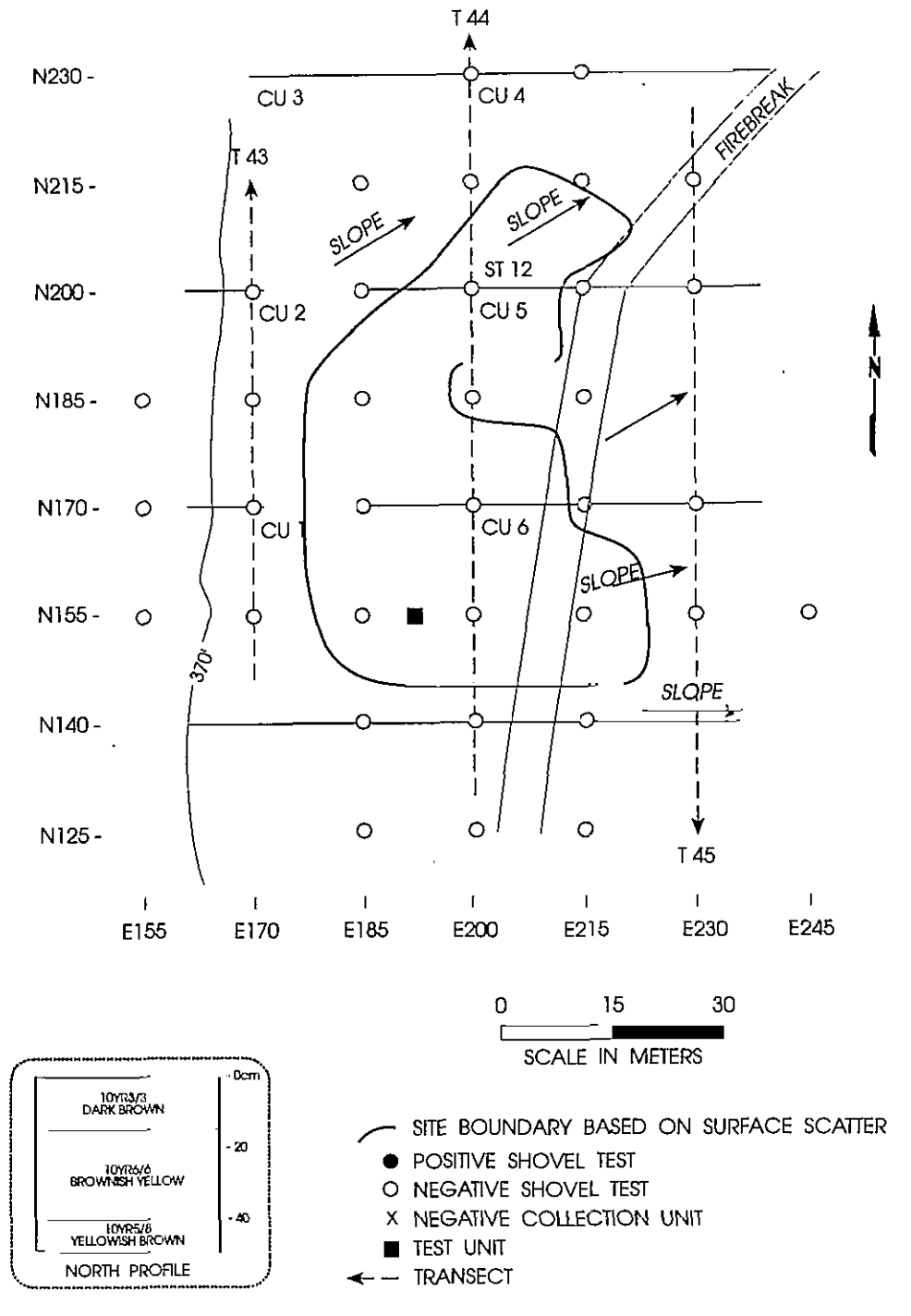

Figure 33. Map of 31HK562* and test unit profile.

from 15 to 75 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts. Excavated to a depth of 50 cm, no artifacts were recovered from this unit. The test unit soil profile consisted of 25 cm of dark brown (10YR 3/3) sand overlying 25 cm of brownish yellow (10YR 6/6) sand over 10 cm of yellowish brown (10YR 5/8) sand. The soils are classified as Candor sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

Only two diagnostic lithic artifacts, a metavolcanic Small Savannah River Stemmed point and a metavolcanic Guilford point, were recovered from this site. A total of 11 Yadkin pottery sherds were also recovered. While able to provide information on temporal placement it seems unlikely that the assemblage exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). No subsurface remains were recovered and soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK562* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK563*

Site 31HK563* is located 1,320 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also 1,200 m south of Manchester Road. The northwestern drainage of Piney Bottom Creek is located 1,360 m southeast of the site. The central UTM coordinates are N3890920 E654995. This site is located on an upland eastern facing slope. The elevation at the site is 194 m above mean sea level and, based on the surface collection, the site measures about 110 m east-west by 160 m north-south making the site approximately 17,600 m^2 in size (Figure 33).

Vegetation at the site is a combination of new growth field grass, which allowed approximately 75% visibility, to the west and a highly eroded slope to a man-made ravine, which allowed 100% visibility to the east. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 20,700 m^2. The surface collection recovered a total of 266 artifacts, while subsurface testing recovered only an additional five artifacts.

The artifacts from the surface collection units are itemized in Table 8. Quartz flakes dominate the collection, although nine tools were recovered. The two projectile point fragments were both of quartz and highly fragmented. Collection Unit 11 produced a point tip, while Collection Unit 13 produced a portion of a stem. Neither could be further identified. Five quartz biface fragments were also recovered. Measurements are not provided since none appear complete. The single metavolcanic tool recovered from the site is an end scraper from Collection Unit 20. It measures 18.67 mm in length, 21.96 mm in width, 5.34 mm in thickness, and has a blade angle of 77°.

Using ST17 on T44 as a base point, designated N200E200, an additional 41 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. Only three yielded any additional artifacts. One used metavolcanic flake and one interior quartz flake were recovered from shovel test N215E260. One interior metavolcanic flake was recovered from shovel test N230E230 and one interior quartz flake was recovered from shovel test N260E230. All shovel tests were excavated to depths ranging from 10 to 75 cm below surface. No shovel tests were excavated in the highly eroded northeastern section of the site. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the greatest soil integrity. Excavated to a depth of 60 cm only one interior metavolcanic flake was recovered at the 30 to 40 cm level. The test unit soil profile consisted of 10

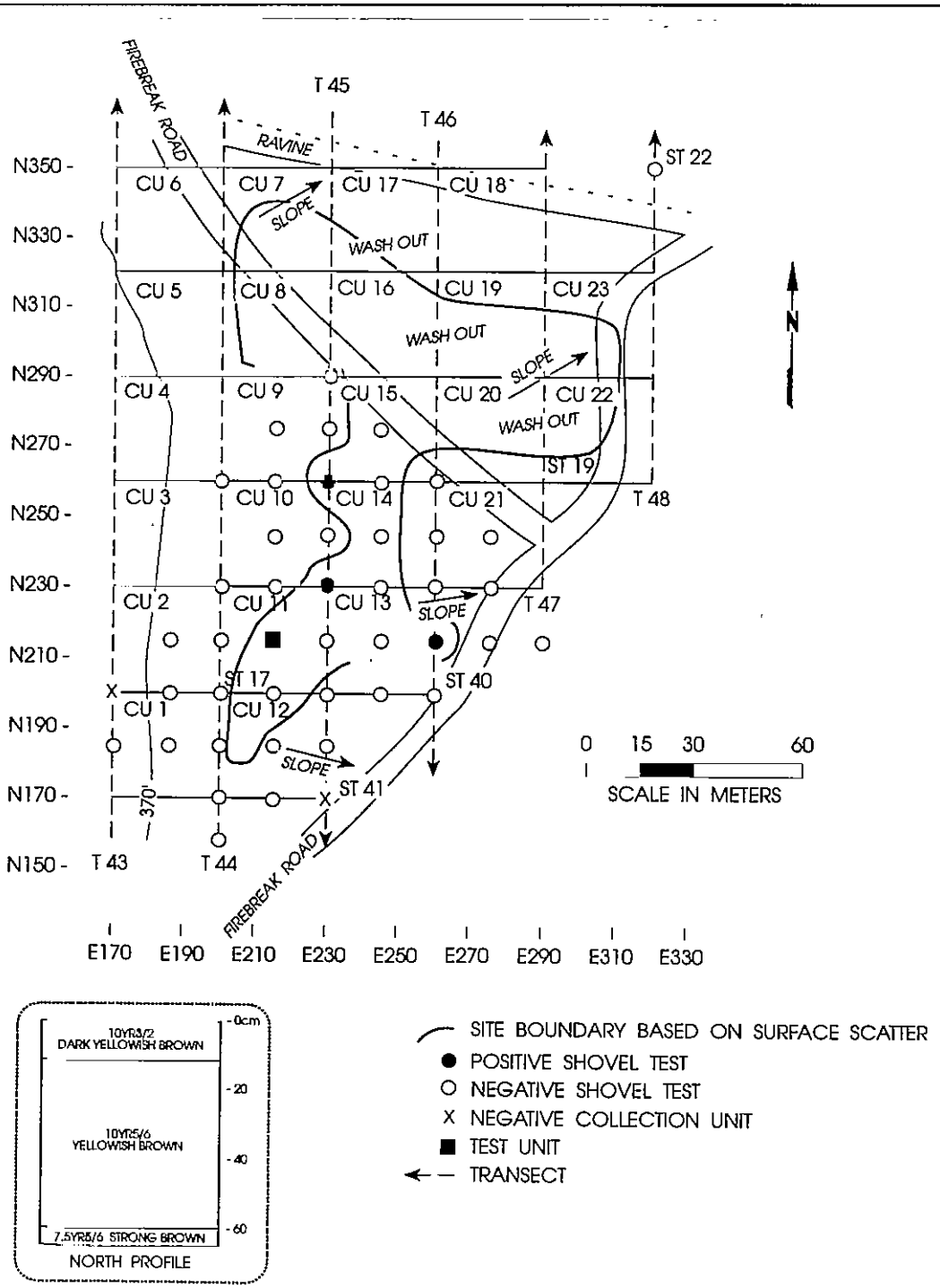

Figure 34. Map of 31HK563* and test unit profile.

Table 8.
Artifacts Collected from 31HK563*

Coll Unit	Points	Bifaces	Used Flakes	Scraper	Metavolcanic Primary	Metavolcanic Interior	Quartz Primary	Quartz Interior	Quartz Shatter	Raw Material
7								8		2
8						2		16		4
11	1					2		17		
12								2		
13	1	1				1	1	10	1	
14		1						7	1	
15		1	1			2		53	2	
16		1						27	5	2
17								3		
19		1						10		
20				1	1			9		
22								17	2	1
23						1		22	3	1

cm of dark yellowish brown (10YR 3/2) sand overlying 50 cm of yellowish brown (10YR 5/6) sand, over 5 cm of strong brown (7.5YR 5/6) sand. The soils are classified as Candor sand. Although these soils are fairly intact, it is evident from the soil profile that a great deal of erosion has taken place within the drop zone.

No diagnostic artifacts were recovered from this site. It seems unlikely that the lithic debitage and bifaces associated with this site exhibit either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Even though subsurface remains were recovered, soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK563* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK564*

Site 31HK564* is located 1,350 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also 540 m south of Manchester Road. The northwestern drainage of Piney Bottom Creek is located 1,800 m southeast of the site. The central UTM coordinates are N3891830 E655030. This site is located on a ridge top. A 20° slope to north and northwest lies 15 to 20m from the site. The elevation at the site is 131 m above mean sea level and, based on the surface collection, the site measures about 40 m east-west by 45 m north-south making the site approximately 1,800 m^2 in size (Figure 34).

Vegetation at the site is non-existent, allowing 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered during the surface collection. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 3,600 m^2. The surface collection recovered a total of 38 artifacts. Subsurface testing yielded one additional artifact. Collection Unit 1 yielded three artifacts. These included two interior quartz flakes and one quartz Caraway (Coe 1964:49) projectile point. The measurements for the point are 33.85 mm in length, 12.69 mm in width and 6.03 mm in thickness. Collection Unit 2 contained a total of 16 artifacts. These included one used metavolcanic flake, 14 interior quartz flakes, and one quartz biface. The biface measures 25.30 mm in length, 19.53 mm in width, and 7.75 mm in thickness. Collection Unit 3 contained a total of 12 interior quartz flakes. Collection Unit 4 contained a total of six interior quartz flakes.

Using ST18 on T45 as a base point, designated N200E200, an additional 33 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. None yielded any additional artifacts. All shovel tests were excavated to depths ranging from 30 to 75 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

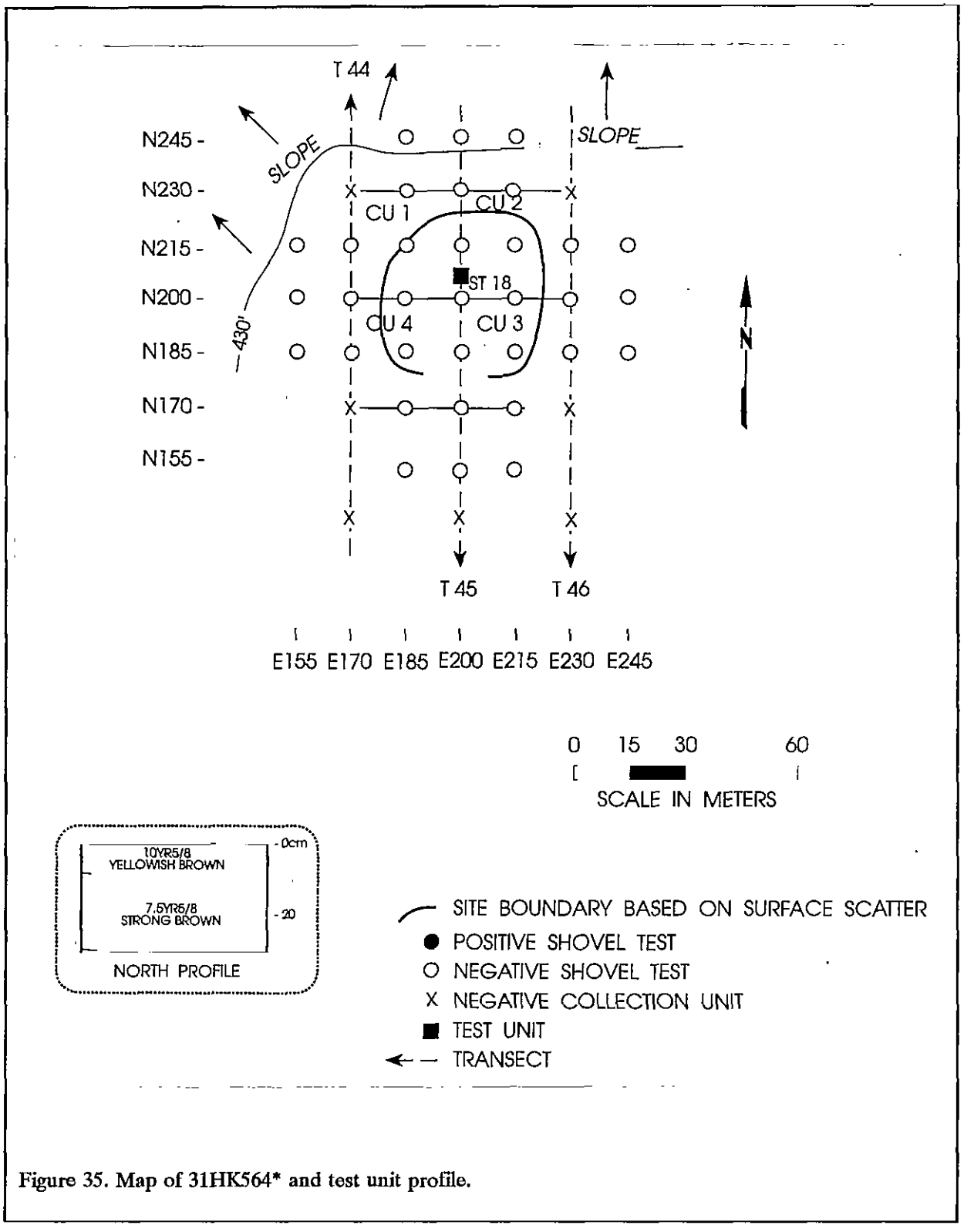

Figure 35. Map of 31HK564* and test unit profile.

A 50 cm test unit was centrally placed in an area toward the bluff which contained a high concentration of surface artifacts. Excavated to a depth of 30 cm, one interior quartz flake was recovered from this unit at the 0-10 cm level. The test unit soil profile consisted of 7 cm of yellowish brown (10YR 5/8) sand overlying 23 cm of strong brown (7.5YR 5/8) sand. The soils are classified as Candor sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

Only one diagnostic artifact, a Caraway point, was recovered from this site. While able to provide information on temporal placement it seems unlikely that the assemblage exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Even though subsurface remains were recovered, soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK564* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK566*

Site 31HK566* is located 1,590 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also 480 m south of Manchester Road. The southern drainage of James Creek is located 1,800 m northwest of the site. The central UTM coordinates are N3892040 E655280. This site is located on a ridge toe. A 20° slope to north, northwest and northeast lies approximately 40 m from the site. The elevation at the site is 134 m above mean sea level and, based on the surface collection, the site measures about 30 m east-west by 50 m north-south, making the site approximately 1,500 m^2 in size (Figure 35).

Vegetation at the site is non-existent, allowing 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although the site was initially discovered during surface collection. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 5,400 m^2. The surface collection recovered a total of 37 artifacts. No additional artifacts were recovered during subsurface testing. Collection Unit 1 contained 13 artifacts. These included two interior metavolcanic flakes, 10 interior quartz flakes, and one quartz biface fragment. Collection Unit 2 contained a total of five artifacts. These included four interior quartz flakes and one quartz Palmer Corner-Notched (Coe 1964:67) projectile point. The measurements for the Palmer are 20.42 mm in length, 13.47 mm in width, and 5.39 mm in thickness. Collection Unit 3 contained one interior metavolcanic flake and one metavolcanic Caraway (Coe 1964:49) projectile point. The measurements for the Caraway point are 30.32 mm in length, 21.55 mm in width, and 3.71 mm in thickness. Collection Unit 4 contained no artifacts. Collection Unit 5 contained a total of 10 artifacts. These included one interior metavolcanic flake, one metavolcanic Palmer Corner-Notched (Coe 1964:67) projectile point, and eight interior quartz flakes. The measurements for the Palmer point are 39.95 mm in length, 22.68 mm in width, 11.40 mm in thickness, and a basal width of 17.50 mm. Collection Unit 6 contained a total of seven artifacts. These included two interior metavolcanic flakes, three interior quartz flakes, one quartz end scraper fragment, and one quartz Kirk Stemmed (Coe 1964:70) projectile point. The measurements for the end scraper are 20.02 mm in length, 10.35 in width, 6.45 mm in thickness, and a blade angle of 61°. The measurements for the quartz Kirk Stemmed point are 44.69 mm in length, 21.77 in width, and 8.68 mm in thickness.

Using ST16 on T453 as a base point, designated N200E200, an additional 32 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. None yielded any additional artifacts. All shovel tests were excavated to depths ranging from 15 to 75 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area toward the bluff which contained a high concentration of artifacts. Excavated to a depth of 50 cm, no artifacts were recovered from this unit.

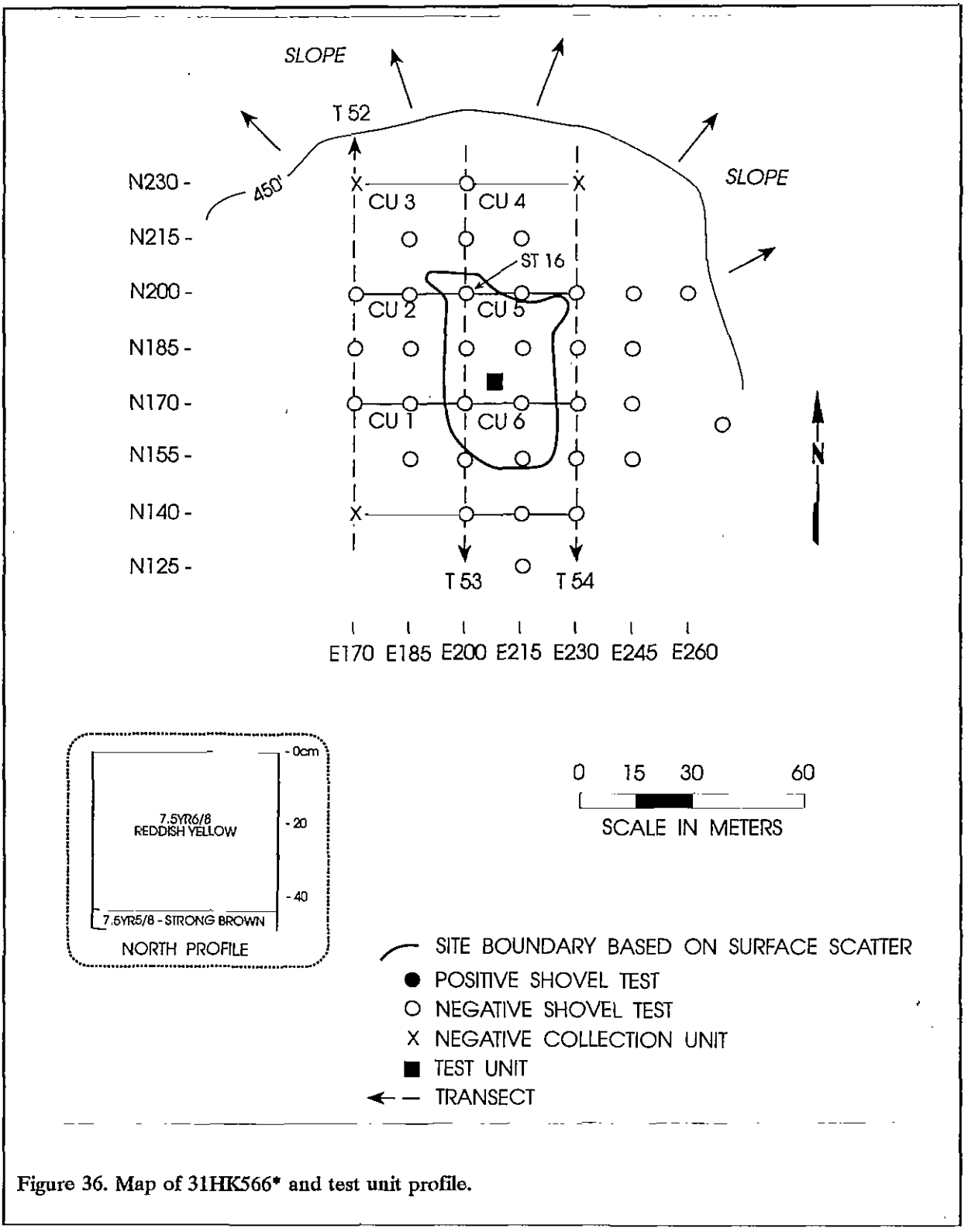

Figure 36. Map of 31HK566* and test unit profile.

The test unit soil profile consisted of 45 cm of reddish yellow (10YR 5/8) sand overlying 5 cm of strong brown (7.5YR 5/8) sand. The soils are classified as Blaney sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

A total of four diagnostic lithic artifacts were recovered from this site, including two Palmer Corner-Notched projectile points, one quartz Palmer Corner-Notched point, a quartz Kirk Stemmed point, and a Caraway projectile point. While able to provide information on temporal placement it seems unlikely that the assemblage exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Even though subsurface remains were recovered, soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK566* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK568*

Site 31HK568* is located 1,650 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also 150 m south of Manchester Road. The southern drainage of James Creek is located 1,700 m northwest of the site. The central UTM coordinates are N3892290 E655350. This site is located on a 15° ridge slope to the north, northwest, and northeast and is bordered by fire break roads to the north and east. The elevation at the site is 119 m above mean sea level and, based on the surface collection, the site measures about 55 m east-west by 65 m north-south making the site approximately 3,575 m^2 in size (Figure 36).

Vegetation at the site is sparse grass which allowed approximately 50% visibility. The site was first encountered during the running of routine transects associated with shovel testing although artifacts were initially discovered during surface collection. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 5,400 m^2. The surface collection recovered a total of 31 artifacts. Three additional artifacts were recovered during subsurface testing. Collection Unit 1 contained eight interior quartz flakes. Collection Unit 2 contained a total of eight interior quartz flakes and one quartz biface fragment. Collection Unit 3 contained one interior quartz flake and one quartz biface fragment. Collection Unit 4 contained a total of three interior quartz flakes. Collection Unit 5 contained one interior metavolcanic flake and five interior quartz flakes. Collection Unit 6 contained one interior quartz flake.

Using ST54 on T55 as a base point, designated N200E200, an additional 32 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. Shovel test N185E170 yielded one quartz biface and shovel test N230E215 yielded one interior quartz flake. The quartz biface measures 51.68 mm in length, 40.70 mm in width, and 16.22 mm in thickness. All shovel tests were excavated to depths ranging from 20 to 80 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area toward the bluff which contained a high concentration of artifacts. Excavated to a depth of 50 cm. One interior quartz flake was recovered from the 0-10 cm level. The test unit soil profile consisted of 12 cm of yellowish brown (10YR 5/6) sand overlying 17 cm of reddish yellow (7.5YR 6/6) sand over 21 cm of strong brown (7.5YR 5/8) sand with reddish yellow (5YR 7/6) mottles. The soils are classified as Blaney sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

No diagnostic artifacts were recovered from this site. The lithic debitage associated with this site does not exhibit either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Even though subsurface remains were recovered, soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK568* is recommended as not eligible for inclusion on the National Register of Historic Places.

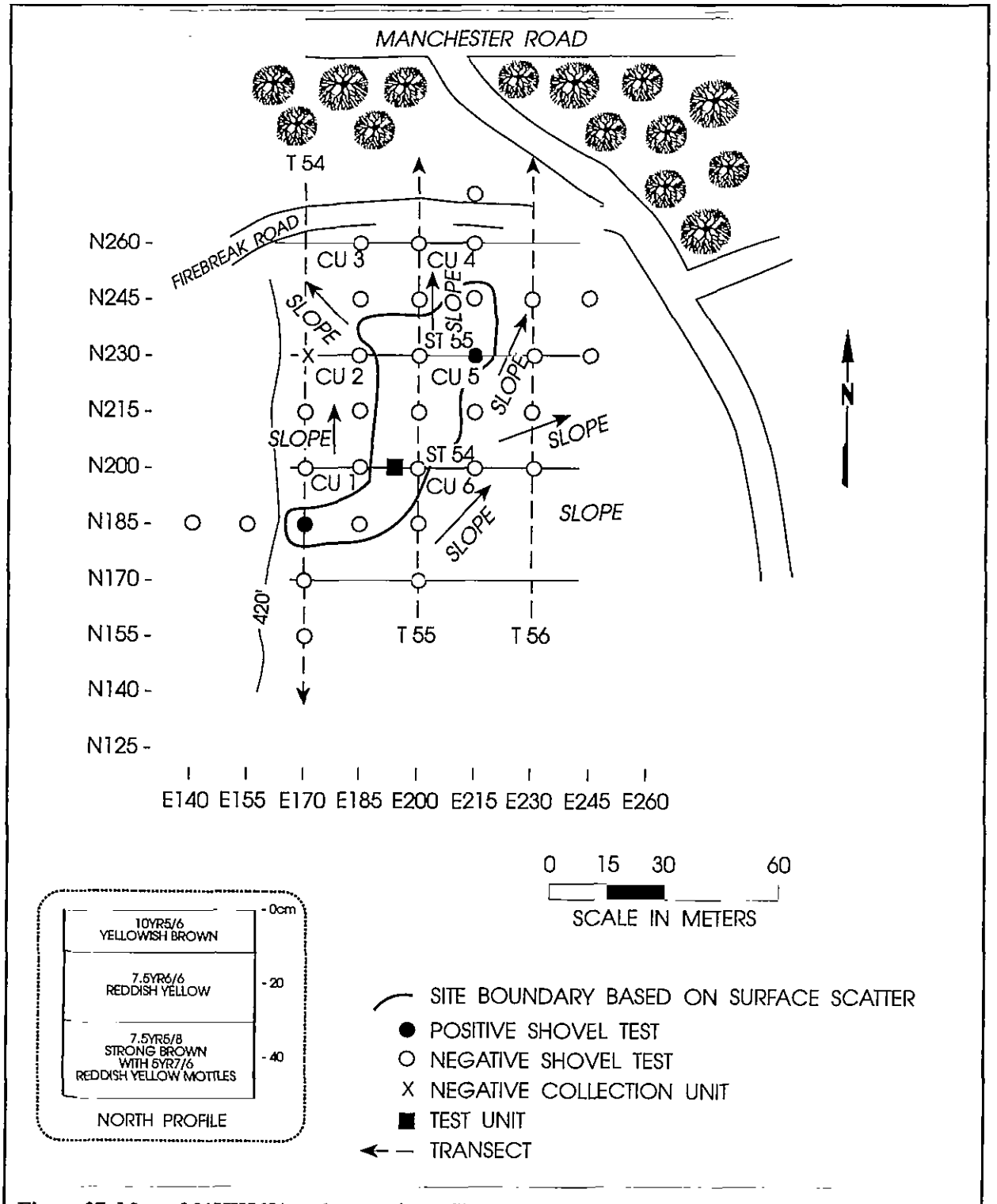

Figure 37. Map of 31HK568* and test unit profile.

31HK570*

Site 31HK570* is located 1,740 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also 600 m south of Manchester Road. The southern drainage of James Creek is located 2,000 m northwest of the site. The central UTM coordinates are N3892080 E655430. This site is located on a ridge top. A 15 to 20% slope to the north lies along the northernmost edge of the site. The elevation at the site is 119 m above mean sea level and, based on the surface collection, the site measures about 140 m east-west by 50 m north-south making the site approximately 7,000 m^2 in size (Figure 37).

Vegetation at the site is non-existent, allowing 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 10,800 m^2. The surface collection recovered a total of 39 artifacts. No additional artifacts were recovered during subsurface testing.

Collection Unit 2 contained one interior metavolcanic flake. Collection Unit 3 contained a total of 15 artifacts. These included 12 interior metavolcanic flakes, one used metavolcanic flake, one interior quartz flake, one chert raw material (2.87g), and one quartz scraper. The measurements for the quartz scraper are 23.17 mm in length, 34.29 mm in width, 9.13 mm in thickness, with a blade angle of 62°. Collection Unit 4 contained seven artifacts. These included five interior metavolcanic flakes and two interior quartz flakes. Collection Unit 5 contained five interior metavolcanic flakes and two interior quartz flakes. Collection Unit 6 contained four interior metavolcanic flakes and one highly eroded metavolcanic biface. Collection Unit 7 contained one interior metavolcanic flake and one interior quartz flake. Collection Unit 8 contained one interior metavolcanic flake and one interior quartz flake.

Using ST20 on T58 as a base point, designated N200E200, an additional 53 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. No additional artifacts were recovered during subsurface testing. All shovel tests were excavated to depths ranging from 10 to 75 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts and excavated to a depth of 30 cm. No artifacts were recovered from the test unit. The test unit soil profile consisted of 30 cm of strong brown (7.5YR 5/8) sand. The soils are classified as Blaney sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

No diagnostic artifacts were recovered from this site. The lithic debitage associated with this site does not exhibit either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Soil profiles indicate that the site has been heavily eroded and deflated. Site 31HK570* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK573*

Site 31HK573* is located 1,740 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road. It is also immediately south of Manchester Road. The southern drainage of James Creek is located 400 m northwest of the site. The central UTM coordinates are N3892665 E655435. This site is located on a 10% ridge slope to the west. The elevation at the site is 122 m above mean sea level and, based on the surface collection, the site measures about 40 m east-west by 15 m north-south making the site approximately 600 m^2 in size (Figure 38).

Vegetation at the site is sparse grass to the north which allowed approximately 75% visibility and sparse grass with woods to the south which allowed approximately 10 to 20% visibility. The site was first encountered during the running of

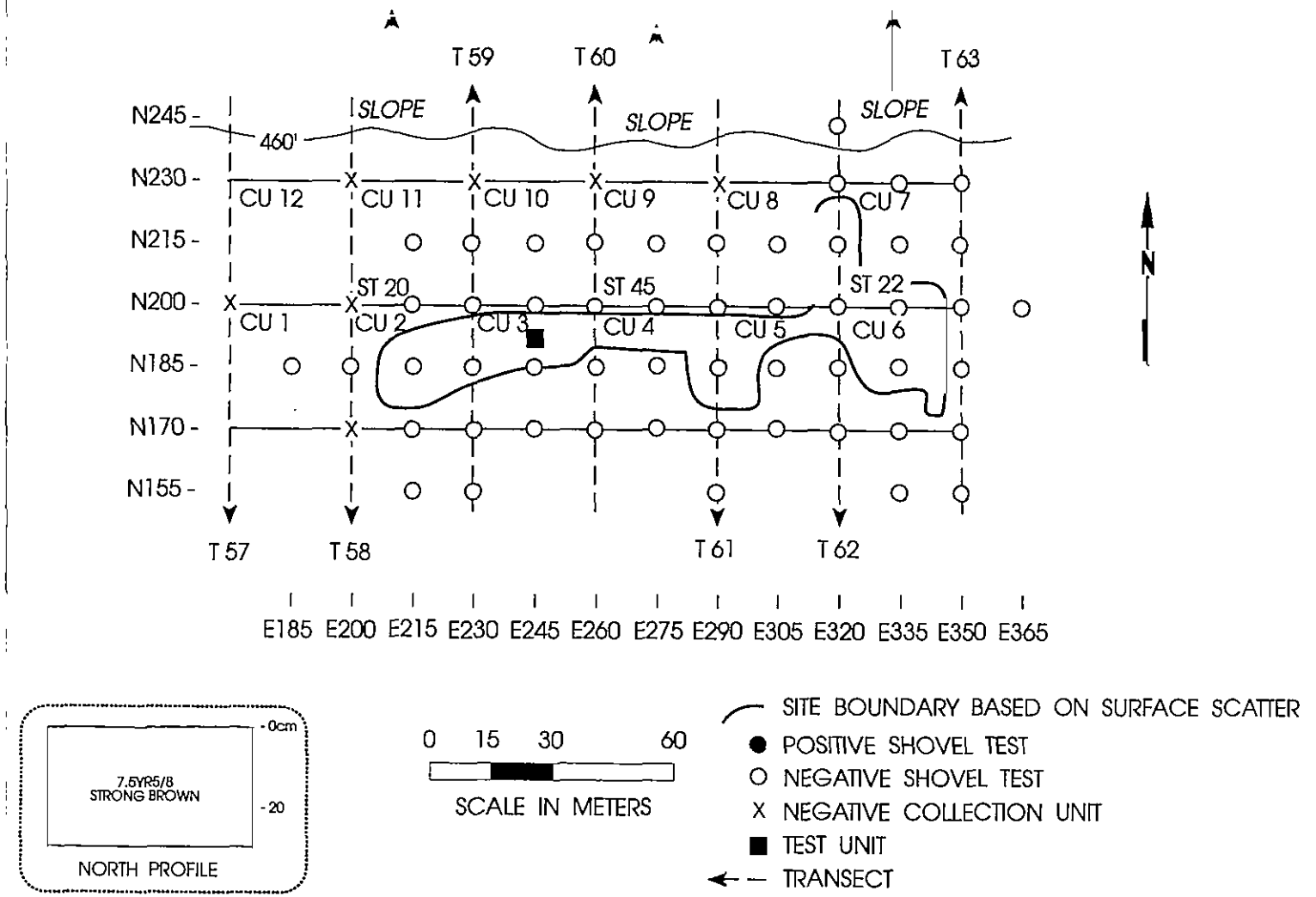

Figure 38. Map of 31HK570* and test unit profile.

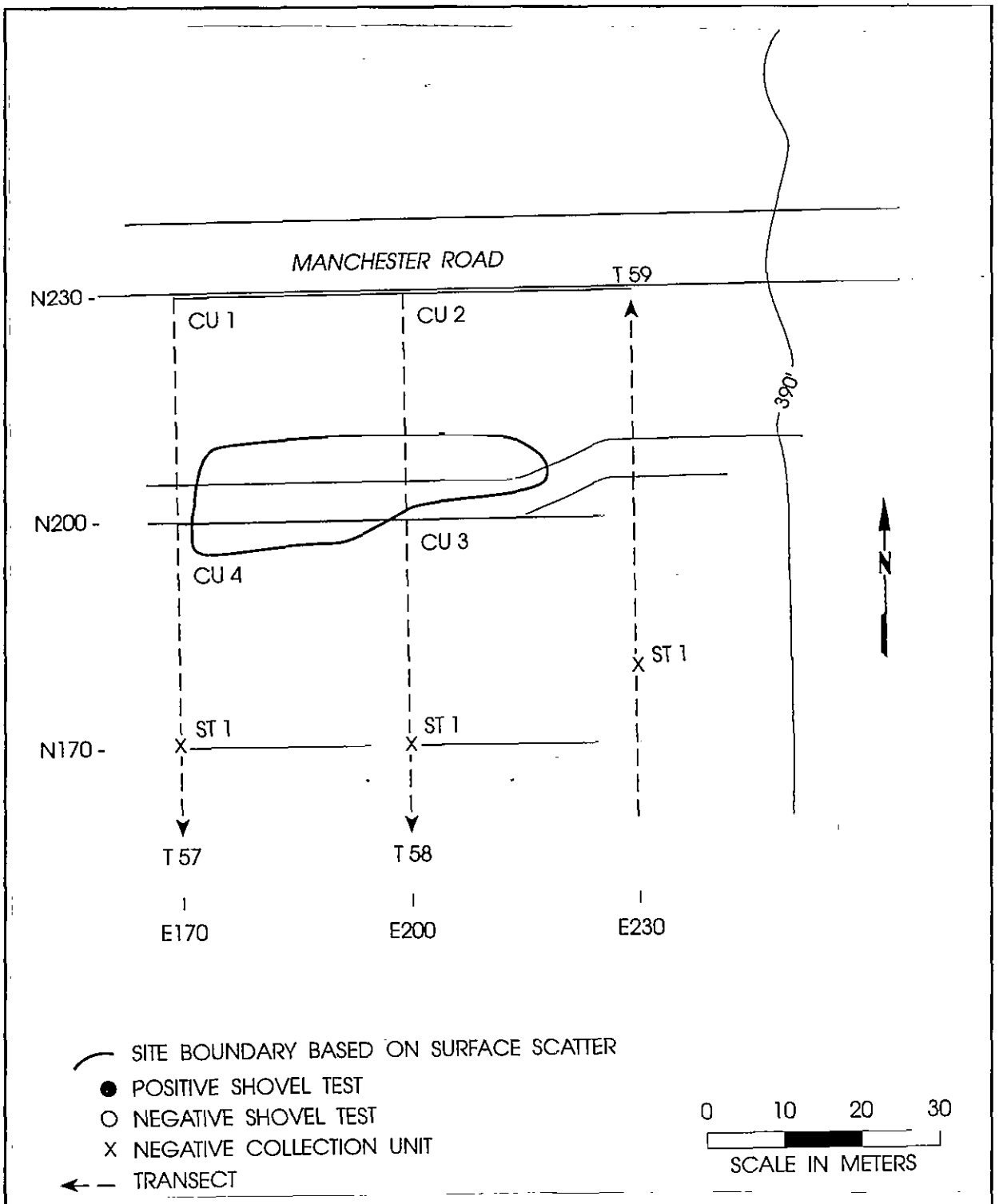

Figure 39. Map of 31HK573* and test unit profile.

routine transects associated with shovel testing although the site was initially discovered during surface collection. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 3,600 m^2. The surface collection recovered a total of 66 artifacts. Due to the poor stratigraphic condition of the site due to road and fire break construction no shovel tests or a test unit were excavated (Figure 39).

Collection Unit 1 contained a total of 28 artifacts. These included 12 interior metavolcanic flakes, two used metavolcanic flakes, 12 interior quartz flakes, and two quartz biface fragments.

Figure 39. Fire break and road construction damage to 31HK573*.

Collection Unit 2 contained a total of 32 artifacts. These included 16 interior metavolcanic flakes; one metavolcanic biface fragment; 16 interior quartz flakes; one quartz projectile point base fragment, possibly a Morrow Mountain I; one quartz biface fragment; and one quartz preform. The measurements for the Morrow Mountain I fragment are 13.32 mm in length, 21.56 mm in width, and 7.17 mm in thickness. The measurements for the intact quartz biface are 100.34 mm in length, 54.45 mm in width, and 11.27 mm in thickness.

Collection Unit 4 contained six interior metavolcanic flakes.

It is evident from the site's location and condition that these soils are heavily impacted by construction associated with the paving of Manchester Road and the construction of a fire break road due south. Our surface inspection of the site revealed that there were no areas appropriate for subsurface testing and consequently no shovel tests were excavated at this particular site.

Only one diagnostic artifact, a possible Morrow Mountain I point base, was recovered from this site. While able to provide information on temporal placement it seems unlikely that the assemblage exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Due to road construction the site has been heavily eroded and deflated. Site 31HK573* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK577*

Site 31HK577* is located 240 m east of the intersection of Longstreet and Manchester roads. It is also 1,290 m south of Manchester Road. The southern drainage of Piney Bottom Creek is located 2,000 m south of the site. The central UTM coordinates are N3891760 E656160. This site is located on a ridge nose overlooking a southern slope. The elevation at the site is 143 m above mean sea level and, based on the surface collection, the site measures about 5 m east-west

by 5 m north-south making the site approximately 25 m^2 in size (Figure 40).

There is no vegetation at the site, providing 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered during surface collection. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 3,600 m^2. The surface collection recovered a total of seven artifacts. No artifacts were recovered during subsurface testing. Collection Unit 1 contained two interior metavolcanic interior flakes. Collection Unit 2 contained a total of five artifacts. These included one primary metavolcanic flake and four interior metavolcanic flakes.

Using ST22 on T82 as a base point, designated N200E200, an additional nine shovel tests were excavated in a cardinal grid pattern at 10 m intervals. No additional artifacts were recovered during subsurface testing. All shovel tests were excavated to depths ranging from 30 to 40 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts and excavated to a depth of 40 cm. No artifacts were recovered from the test unit. The test unit soil profile consisted of 25 cm of yellowish brown (10YR 5/6) sand and 15 cm of strong brown (7.5YR 5/8) sand. The soils are classified as Blaney sands. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

No diagnostic artifacts were recovered from this site and it seems unlikely that the lithic assemblage exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Site 31HK577* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK585*

Site 31HK585* is located 90 m east of the intersection of Longstreet Road and Manchester roads. It is also 300 m due south of Manchester Road. The western drainage of Tuckahoe Creek is located 450 m east of the site. The central UTM coordinates are N3892020 E656760. This site is located on a 10% ridge slope to the east. The elevation at the site is 137 m above mean sea level and, based on the surface collection, the site measures about 35 m east-west by 40 m north-south making the site approximately 1,400 m^2 in size (Figure 41).

Vegetation at the site is non-existent which allowed 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although artifacts were initially discovered on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 3,600 m^2. The surface collection recovered a total of 10 artifacts. No additional artifacts were recovered during subsurface testing. Collection Unit 1 contained one quartz biface fragment which measured 15.20 mm in length, 20.67 mm in width, and 8.34 mm in thickness. Collection Unit 2 contained one interior quartz flake. Collection Unit 3 contained four interior metavolcanic flakes and two interior quartz flakes. Collection Unit 4 contained two interior quartz flakes.

Using ST10 on T102 as a base point, designated N200E200, an additional 22 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. No additional artifacts were recovered during subsurface testing. All shovel tests were excavated to depths ranging from 15 to 75 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts and excavated to a depth of 60 cm. No artifacts were recovered from the test unit. The test unit soil profile consisted of 20 cm of strong brown (7.5YR 5/8) sand, 15 cm of brownish yellow

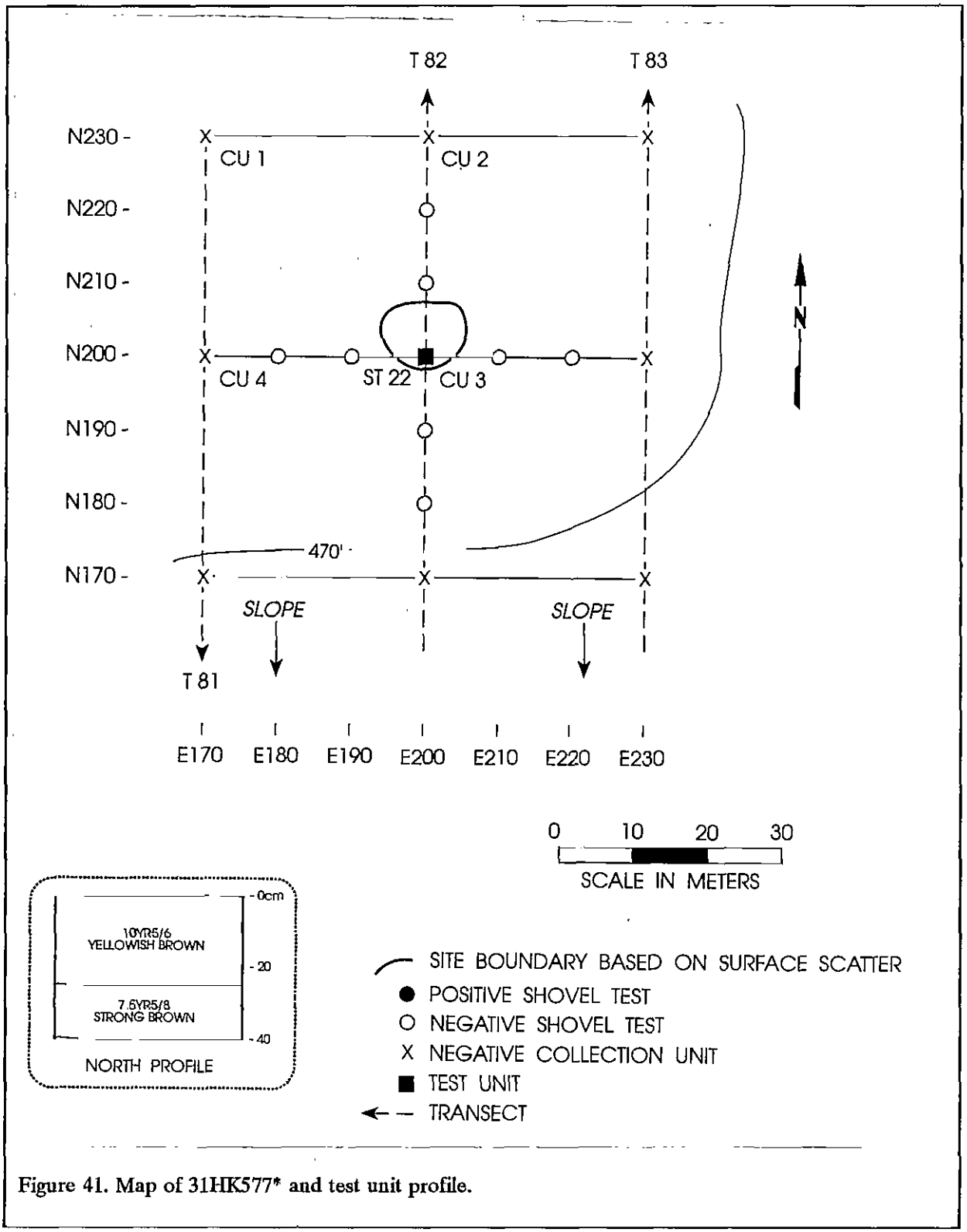

Figure 41. Map of 31HK577* and test unit profile.

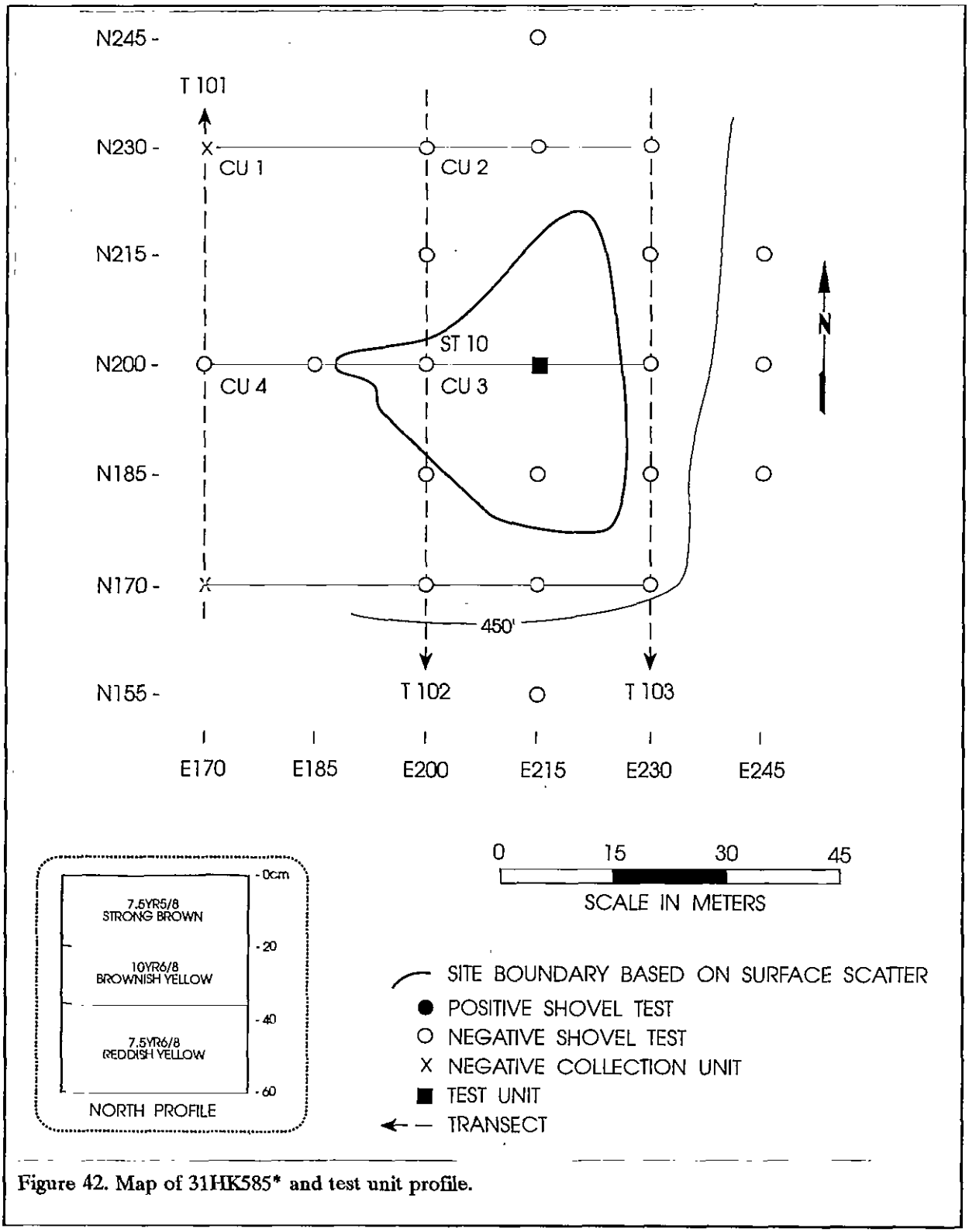

Figure 42. Map of 31HK585* and test unit profile.

(10YR 6/8) sand, and 25 cm of reddish yellow (7.5YR 6/8) sand. The soils are classified as Blaney sands. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

No diagnostic artifacts were recovered from this site and it seems unlikely that the assemblage associated with this site exhibits either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Site 31HK585* is recommended as not eligible for inclusion on the National Register of Historic Places.

31HK591*

Site 31HK591* is located 510 m west of the intersection of Longstreet and Manchester roads. It is also 210 m due south of Manchester Road. The southern drainage of Piney Bottom Creek is located 2,000 m south of the site. The central UTM coordinates are N3892820 E656200. This site is located on a ridge nose overlooking a slope to the northeast. The elevation at the site is 122 m above mean sea level and, based on the surface collection, the site measures about 45 m east-west by 35 m north-south making the site approximately 1,575 m^2 in size (Figure 42).

The vegetation at the site was sparse grass which allowed approximately 95% to 100% visibility. The site was first encountered during the running of routine transects associated with shovel testing although materials were initially discovered on the surface. A controlled surface collection was made using a numerically designated 30 m grid which covered a total of 3,600 m^2. The surface collection recovered a total of 19 artifacts. No artifacts were recovered during subsurface testing. Collection Unit 1 contained seven interior metavolcanic flakes. Collection Unit 2 contained eight interior metavolcanic flakes and one interior quartz flake. Collection Unit 3 contained two interior quartz flakes. Collection Unit 4 contained one interior metavolcanic flake.

Using ST58 on T82 as a base point, designated N200E200, an additional 25 shovel tests were excavated in a cardinal grid pattern at 15 m intervals. No additional artifacts were recovered during subsurface testing. All shovel tests were excavated to depths ranging from 5 to 35 cm below surface. It is evident, from the soil profile, that these soils are heavily depleted through erosion and deflation which is most likely the result of the drop zone being clear cut.

A 50 cm test unit was centrally placed in an area which contained the highest concentration of artifacts and excavated to a depth of 30 cm. No artifacts were recovered from the test unit. The test unit soil profile consisted of 30 cm of strong brown (7.5YR 5/8) sand. The soils are classified as Blaney sand. It is evident from the soil profile that a tremendous amount of erosion has taken place within the drop zone.

No diagnostic artifacts were recovered from this site and it seems unlikely that the lithics at this site exhibit either the data sets or the integrity to provide meaningful information regarding research topics (Townsend et al. 1993:32). Site 31HK591* is recommended as not eligible for inclusion on the National Register of Historic Places.

Isolated Occurrences

These investigations produced a small number of what are termed "isolated occurrences," or materials recovered from surface finds or shovel tests on transect surveys. In each case the initial finding was treated as a site. First, four collection units, 30 m square, were laid out in cardinal directions to form a grid emanating from the central surface collection point or shovel test. After collection, a minimum of eight additional shovel tests were excavated from the central surface find/shovel test station in cardinal directions. Consequently, for each isolated occurrence there was an initial positive surface collection or shovel test station and a minimum of eight negative tests.

Had additional positive tests, or surface material, been found, these occurrences would have been elevated to sites. Since no further

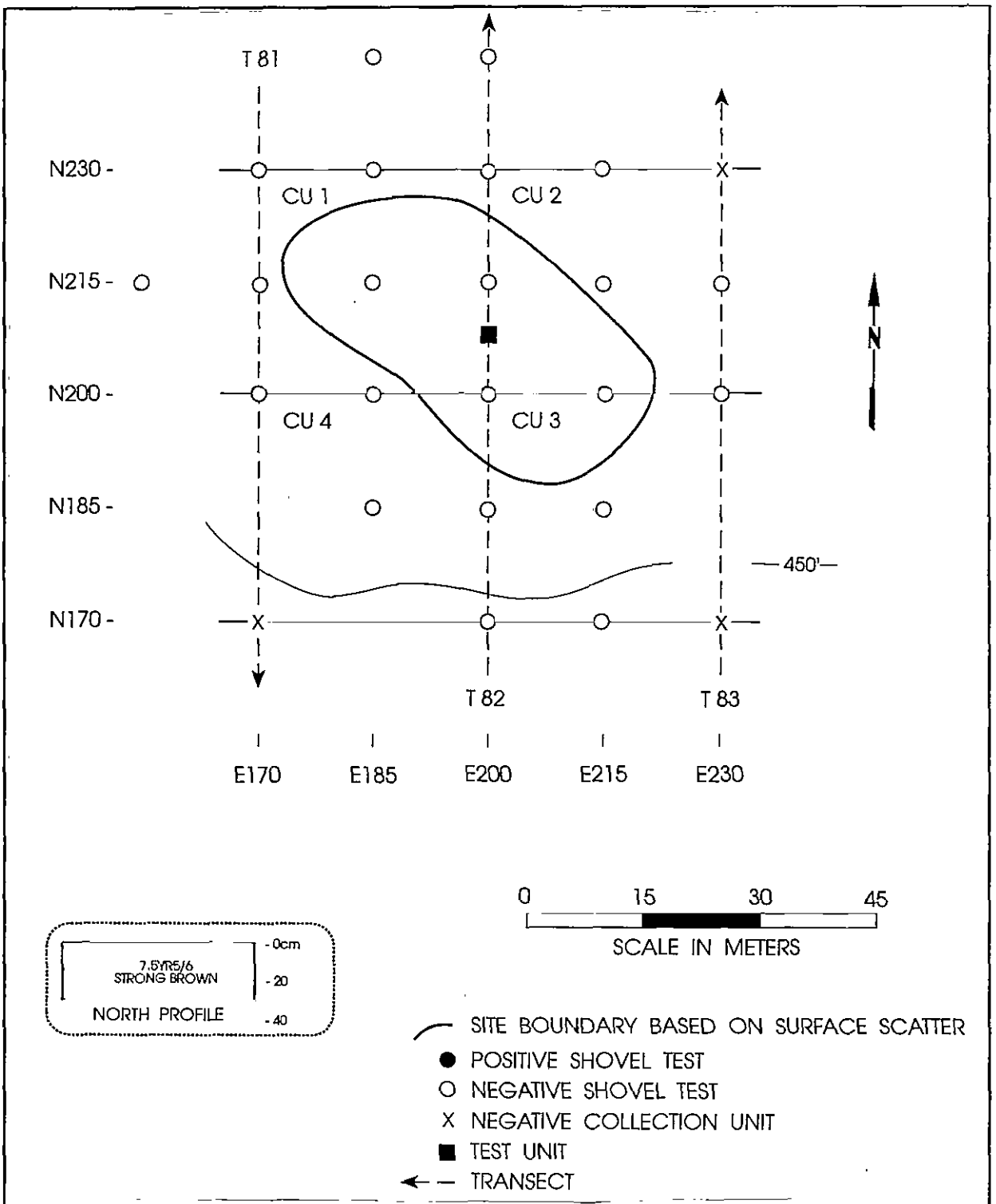

Figure 43. Map of 31HK591* and test unit profile.

material was found, they remain as isolated finds.

Detailed individual site maps are not provided, since in every case such maps would be of no assistance in re-locating the site, establishing its boundaries, or understanding its setting. We have provided small scale sketch maps, however, to help the reader better understand the testing methodology. These occurrences have been given site numbers and are also shown in Figures 43 through 50.

All of these isolated occurrences, by definition, are normally considered not eligible for inclusion on the National Register of Historic Places by the State Historic Preservation Office and we are in concurrence with this assessment for each site.

31HK550*

Site 31HK550* is a lithic scatter located 630 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 420 m south of Manchester Road. The site is situated upon a slight ridge which slopes to the west. The vegetation at the site is sparse grass to the south and east with the western and northern portions of the site being highly eroded. Surface visibility is approximately 75 to 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of three specimens

Collection Unit 1 yielded two interior quartz flakes. Collection Unit 4 yielded one interior metavolcanic flake. The two interior quartz flakes were collected 10 m west of ST4 on T21 (Figure 43). Close interval testing, in cardinal directions, was performed at 15 m intervals. None of the 13 shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891480 E654300.

31HK551*

Site 31HK551* is a lithic scatter located 660 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road and 630 m south of Manchester Road. The site is situated on a ridge nose which slopes to the northeast. The vegetation at the site is sparse grass. Surface visibility is approximately 60 to 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of two specimens.

One quartz flake and one quartz projectile point, identified as a Kirk Corner-Notched, were collected from Collection Unit 4, five meters south of ST19 on T22 (Figure 43). The measurements for the Kirk Corner-Notched are 38.10 mm in length, 22.311 mm in width, and 6.32 mm in thickness. None of the 12 shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891315 E654340.

31HK552*

Site 31HK552* is a lithic scatter located 660 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 540 m south of Manchester Road. The site is situated upon a slight ridge which slopes to the north and northwest. The vegetation at the sight is sparse grass. Surface visibility is approximately 75%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one specimen.

One interior quartz flake was collected 5 m northwest of ST22 on T22 (Figure 43). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891320

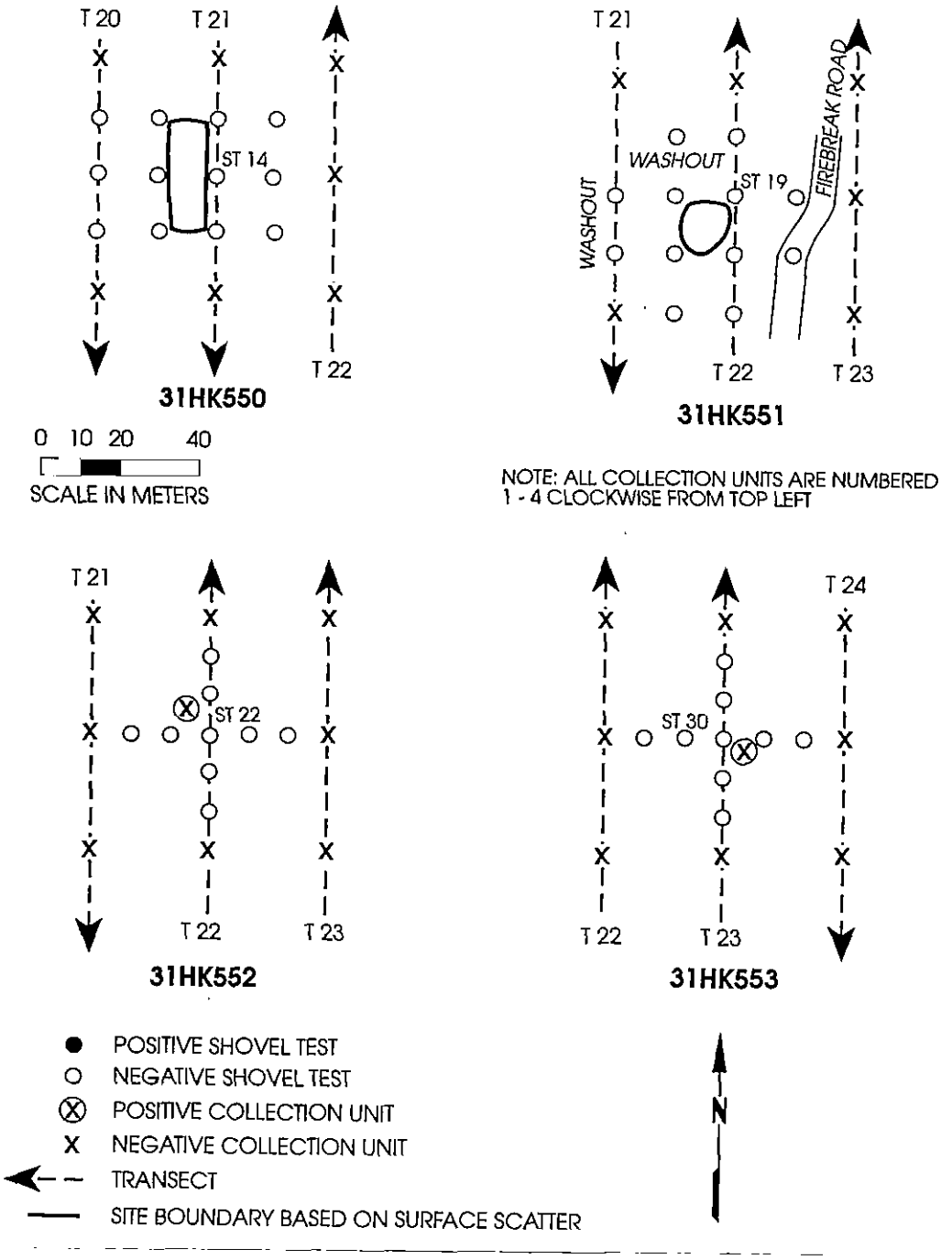

Figure 44. Maps of isolated sites 31HK550* - 31HK553*.

E654330.

31HK553*

Site 31HK553* is a lithic scatter located 690 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 540 m south of Manchester Road. The site is situated upon a slight ridge toe which slopes to the north and northwest. The vegetation at the sight is sparse grass. Surface visibility is approximately 50 to 80%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one specimen.

Collection Unit 1 yielded one interior quartz flake and was collected 0.5 m southeast of ST30 on T23 (Figure 43). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891580 E654360.

31HK554*

Site 31HK554* is a lithic scatter located 750 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 990 m south of Manchester Road. The site is situated on a ridgetop which slopes to the southeast. A fire break road runs to the northeast and southwest through the central portion of the site. The vegetation at the site is sparse grass. Surface visibility is approximately 75%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of two specimens.

Collection Unit 3 yielded one interior quartz flake and one quartz cobble shatter approximately 2 meters southeast of ST33 on T25 (Figure 44). None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3890950 E654400.

31HK555*

Site 31HK555* is a lithic scatter located 840 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 540 m south of Manchester Road. The site is situated on a ridgetop which slopes to the northwest and southeast. A fire break road runs to the northwestern portion of the site. The vegetation at the site is sparse grass. Surface visibility is approximately 50 to 75%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of four artifacts.

Collection Unit 2 yielded one interior quartz flake and one quartz scraper. Collection Unit 4 yielded one interior metavolcanic flake and one interior quartz flake. These were collected approximately 10 meters southwest and northeast of ST38 on T28 (Figure 44). The measurements for the quartz scraper are 44.66 mm in length, 34.36 mm in width, and 15.73 mm in thickness. The blade angle measures 58 degrees. None of the 19 shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891590 E654520.

31HK556*

Site 31HK556* is a lithic scatter located 960 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 390 m south of Manchester Road. The site is situated on a severely eroded ridgetop which slopes to the north. The vegetation at the site is nonexistent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-

south area or approximately 3,600 m^2. The surface collection from this area recovered a total of four artifacts.

Collection Unit 1 yielded one metavolcanic Savannah River Stemmed projectile point base. The measurements for this point base are 38.78 mm in length, 36.01 mm in width, and 9.94 mm in thickness. Collection Unit 2 yielded one interior quartz flake, and one mid-section of a quartz biface fragment. Collection Unit 4 yielded one transversely broken metavolcanic projectile point tip. These were collected approximately 40 meters northeast and southwest of ST46 on T32 (Figure 44). None of the 29 shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891700 E654600.

31HK557*

Site 31HK557* is a lithic scatter located 990 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 480 m south of Manchester Road. The site is situated on a severely eroded ridgetop which slopes to the south. The vegetation at the site is nonexistent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one specimen.

Collection Unit 1 yielded one secondary quartz flake. This was collected approximately 15 meters northwest of ST16 on T33 (Figure 44). Close interval testing was conducted in cardinal directions at 10 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891640 E654700.

31HK558*

Site 31HK558* is a lithic scatter located 1,110 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 990 m south of Manchester Road. The site is situated on the easternmost north-south runway in the drop zone. The vegetation at the site is nonexistent and surface visibility is 100%.

Although out of the survey area, there was adequate time in the survey for us to complete a controlled surface collection, using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one artifact.

Collection Unit 1 yielded one mid-section of a quartz biface fragment was collected 15 meters north of ST22 on T37 (Figure 45). No shovel tests were placed at this site. The central UTM coordinates of this occurrence are N3891520 E654800.

31HK559*

Site 31HK559* is a lithic scatter located 1,110 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 960 m south of Manchester Road. The site is situated on the easternmost north-south runway in the drop zone. The vegetation at the site is nonexistent and surface visibility is 100%.

Although out of the survey area, a controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered three artifacts.

Collection Unit 3 yielded two sections (base and tip) of a metavolcanic Guilford Lanceolate. The measurements for the reconstructed metavolcanic Guilford are 57.46 mm in length, 19.18 mm in width, and 9.50 mm in thickness. Collection Unit 4 yielded one quartz projectile point tip. These artifacts were collected approximately 5 m southwest and 15 meters southeast of ST33 on T37 (Figure 45). No shovel tests were placed at this site. The central UTM coordinates of this occurrence are N3891200 E654790.

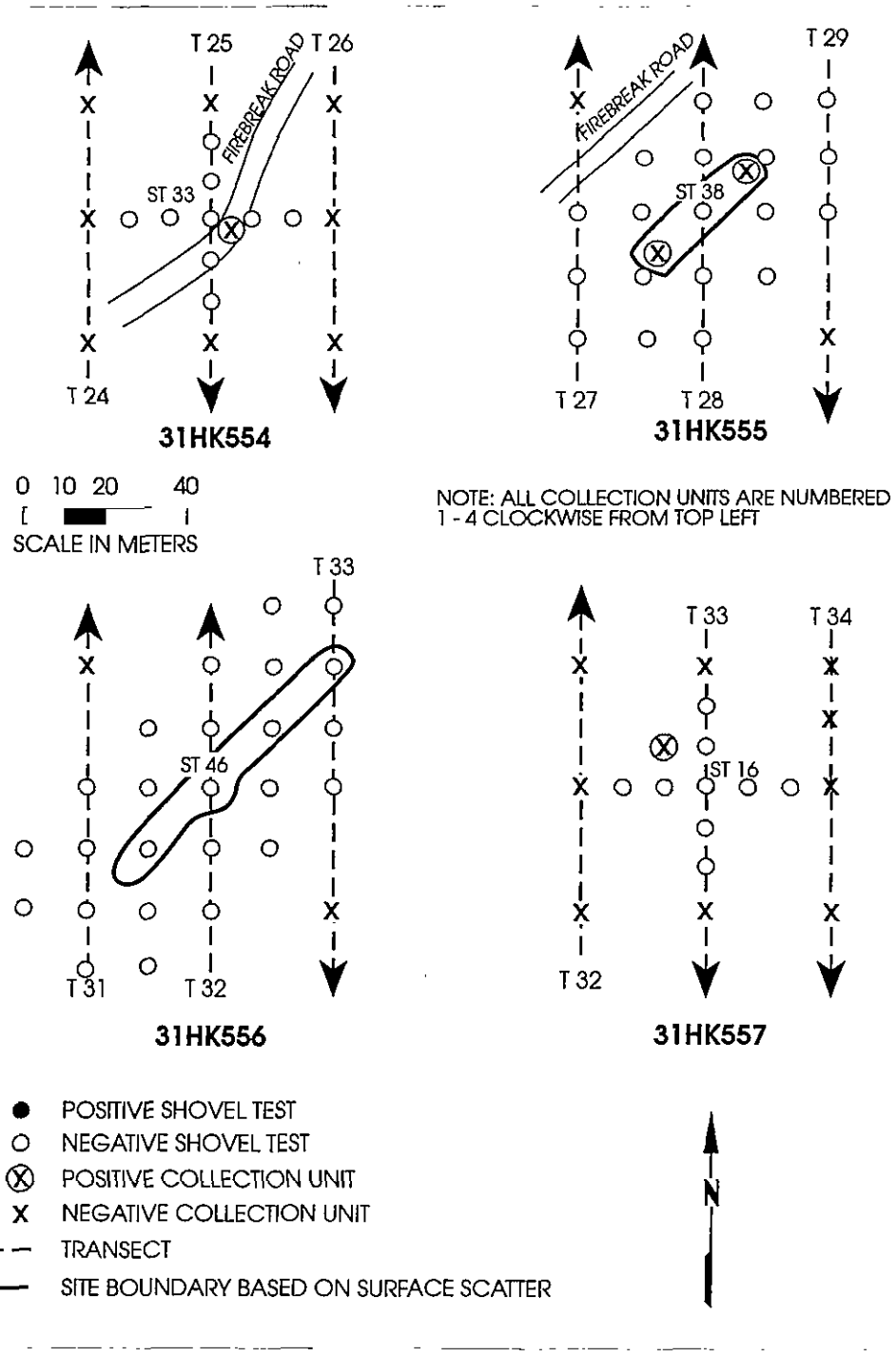

Figure 45. Maps of isolated sites 31HK554* - 31HK557*.

31HK560*

Site 31HK560* is a lithic scatter located 1,290 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 960 m south of Manchester Road. The site is situated on a ridgetop which slopes to the south. Vegetation at the site consists of sparse grass. Surface visibility is approximately 90%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one specimen.

Collection Unit 3 yielded one primary metavolcanic flake. This was collected approximately eight meters south of ST28 on T43 (Figure 45). Close interval testing was conducted in cardinal directions at 10 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891265 E654960.

31HK565*

Site 31HK565* is a lithic scatter located 1,590 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 540 m south of Manchester Road. The site is situated on a slight ridge which slopes to the south. The vegetation at the sight is sparse grass. Surface visibility is approximately 40 to 75%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered four artifacts.

Collection Unit 1 yielded one transversely broken metavolcanic projectile point tip. Collection Unit 2 yielded two interior quartz flakes and Collection Unit 3 yielded one interior quartz flake. These were collected within an 8 m radius of ST39 on T51 (Figure 45). Close interval testing, in cardinal directions, was performed at 15 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891730 E655210.

31HK567*

Site 31HK567* is a lithic scatter located 1,320 m west of the intersection of Longstreet and Manchester roads and 570 m south of Manchester Road. The site is situated on a ridge top which slopes to the north. There is no vegetation at the site and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered two artifacts.

Collection Unit 2 yielded one metavolcanic scraper. The measurements for the scraper are: length 54.42 mm, width 47.71 mm, width 6.22 mm, and an angle of 84 degrees. Collection Unit 3 yielded one interior quartz flake. These were collected approximately 3 to 25 m southeast of ST40 on T55 (Figure 46). Close interval testing, in cardinal directions, was performed at 15 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891840 E655380.

31HK569*

Site 31HK569* is a lithic scatter located 1,740 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 180 m south of Manchester Road. The site is situated on a north facing ridge slope. Vegetation at the site consists of sparse grass and sand. Surface visibility is approximately 75%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered three specimens.

Collection Unit 4 yielded one interior metavolcanic flake and two interior quartz flakes. These were collected approximately 2 m southwest

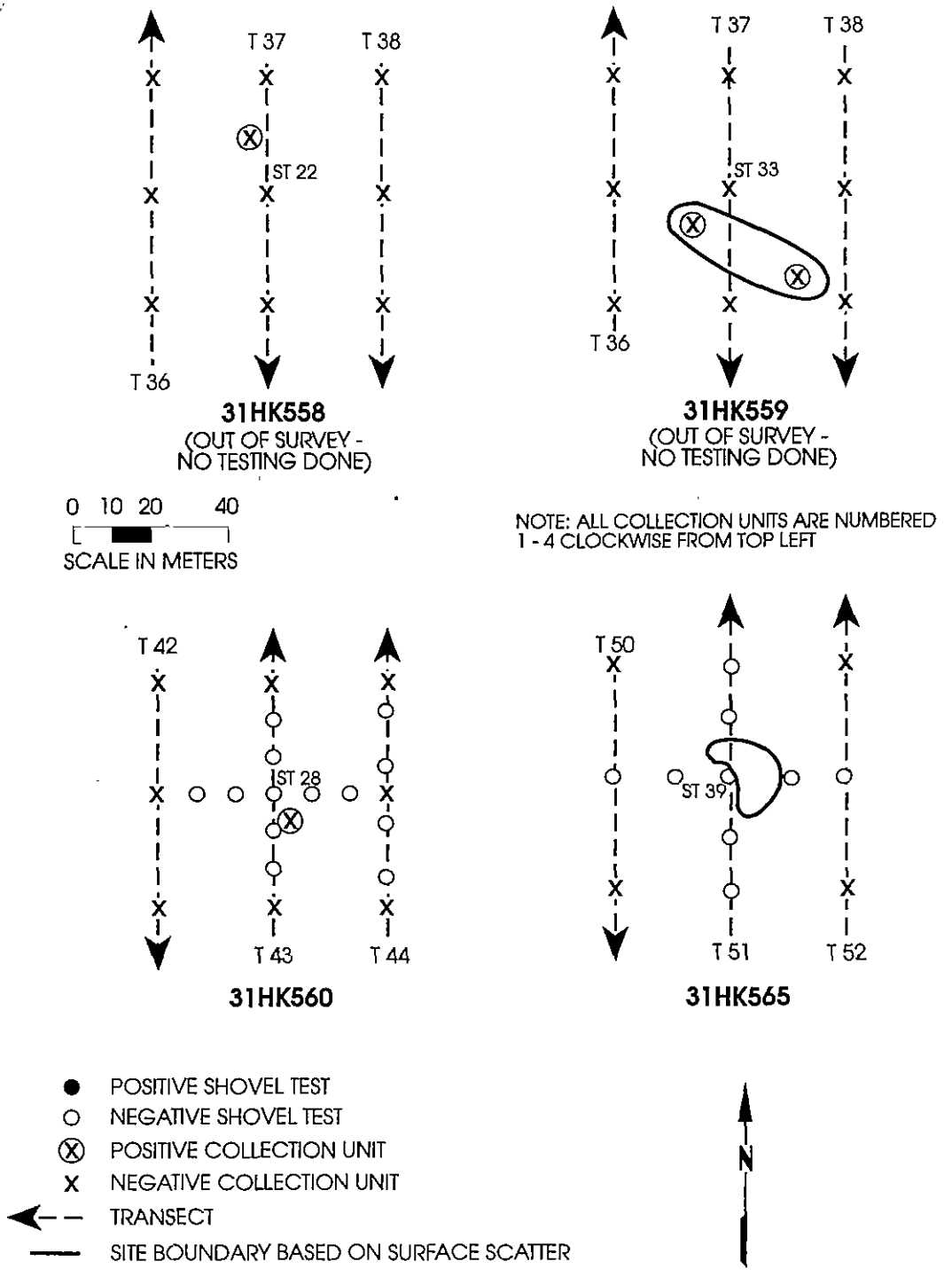

Figure 46. Maps of isolated sites 31HK558* - 31HK565*.

of ST3 on T58 (Figure 46). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892580 E655460.

31HK571*

Site 31HK571* is a lithic scatter located 1,800 m west of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 510 m south of Manchester Road. The site is situated on a northwest facing ridge slope. Vegetation at the site consists of sparse grass and sand. Surface visibility is approximately 75%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered one artifact.

Collection Unit 1 yielded one quartz projectile point tip. This was collected approximately 2 m northeast of ST48 on T60 (Figure 46). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892200 E655500.

31HK572*

Site 31HK572* is a lithic scatter located 1,950 m east of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 330 m south of Manchester Road. The site is situated on a northern facing ridge slope. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered two artifacts.

Collection Unit 1 yielded one interior metavolcanic flake and one quartz Caraway Triangular projectile point. The measurements for the Caraway point are 22.50 mm in length, 16.86 mm in width and 4.24 mm in thickness. These were collected approximately 3 to 10 m northwest of ST11 on T65 (Figure 46). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892500 E655650.

31K574*

Site 31HK574* is a lithic scatter located 2,340 m west of the intersection of Fort Bragg Fire Break 24 and Manchester Road, and 570 m south of Manchester Road. The site is situated on a northwestern facing ridge slope. A firebreak road, running south-west by north-east, runs through the center of the site. Vegetation at the site is sparse grass and surface visibility is 75 to 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered two specimens.

One interior metavolcanic flake was found on the surface at ST48 on T78. Collection Unit 3 yielded one interior metavolcanic flake. This was collected approximately 3 to 10 m southeast of ST48 on T78 (Figure 47). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892480 E656085.

31HK575*

Site 31HK575* is a lithic scatter located 2,340 m west of the intersection of Longstreet and Manchester roads, and 360 m south of Manchester Road. The site is situated on a north facing ridge slope. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered four artifacts.

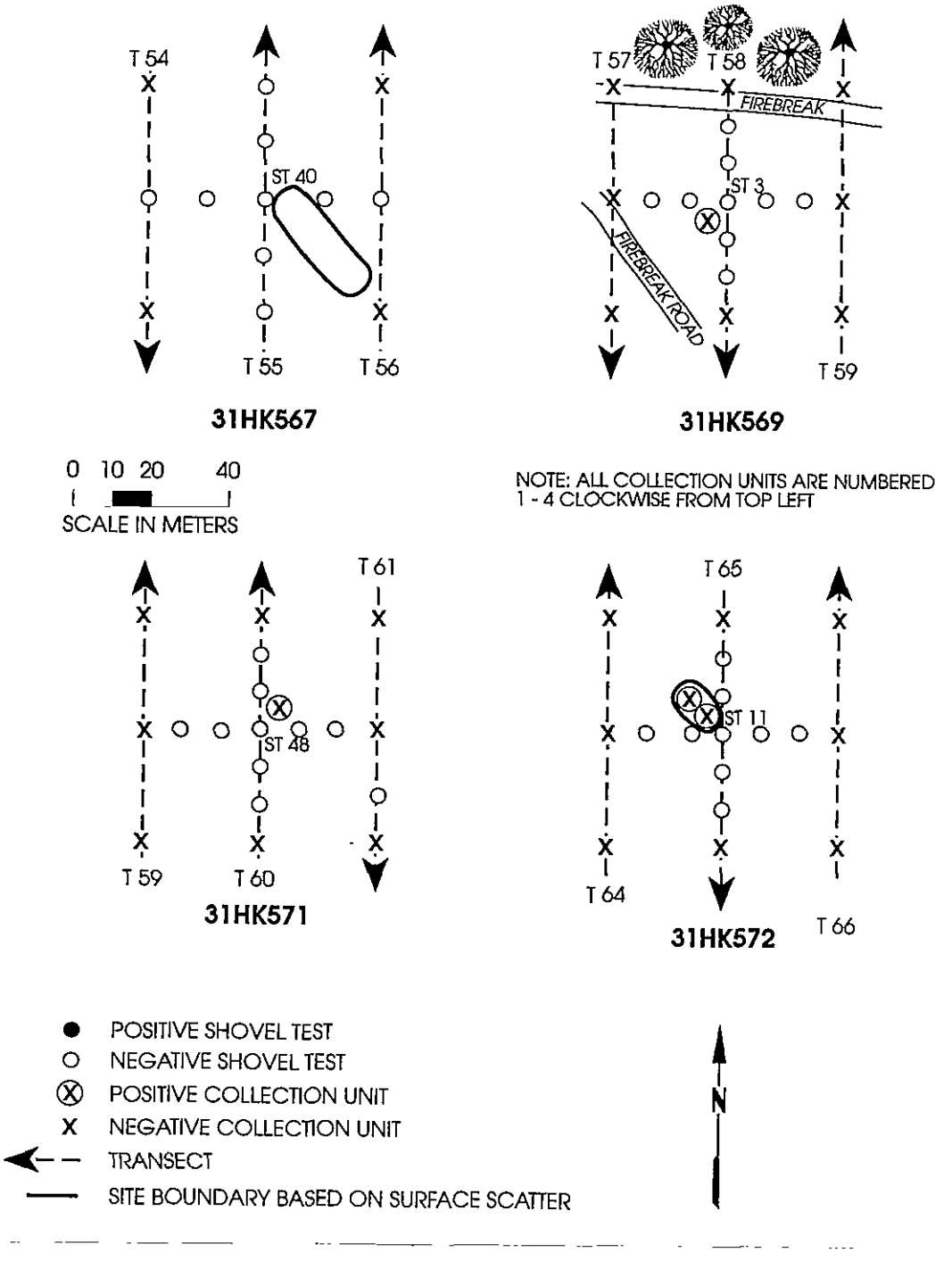

Figure 47. Maps of isolated sites 31HK567* - 31HK572*.

Collection Unit 2 yielded one interior metavolcanic flake. Collection Unit 3 yielded one metavolcanic primary flake. Collection Unit 4 yielded one interior metavolcanic flake and one metavolcanic biface fragment. These were collected east of ST55 on T78 (Figure 47). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892700 E656060.

31HK576*

Site 31HK576* is a lithic scatter located 570 m west of the intersection of Longstreet and Manchester roads, and 180 m south of Manchester Road. The site is situated on a ridge nose with a north facing slope. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered four artifacts.

Collection Unit 2 yielded two interior metavolcanic flakes. Collection Unit 3 yielded one metavolcanic Uwharrie projectile point base. The Uwharrie base measures 17.69 mm in width and 3.81 mm in thickness. Collection Unit 4 yielded one interior metavolcanic flake. These were collected south and east of ST6 on T80 (Figure 47). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892940 E656140.

31HK578*

Site 31HK578* is a lithic scatter located 570 m west of the intersection of Longstreet and Manchester roads, and 540 m south of Manchester Road. The site is situated on a ridge nose with a southern and eastern facing slope. Vegetation at the site is sparse grass and surface visibility is approximately 50 to 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered one artifact.

One basal portion of a quartz biface was collected approximately 10 m southeast of ST47 on T80 (Figure 47). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891690 E656115.

31HK579*

Site 31HK579* is a lithic scatter located 300 m west of the intersection of Longstreet and Manchester roads, and 1,590 m south of Manchester Road. The site is situated on a ridge nose with a southern and eastern facing slope. Vegetation at the site is sparse grass and surface visibility is approximately 50 to 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered one specimen.

Collection Unit 2 yielded one interior quartz flake. This was collected approximately 8 m northeast of ST10 on T89 (Figure 48). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891560 E656415.

31HK580*

Site 31HK580* is a lithic scatter located 180 m west of the intersection of Longstreet and Manchester roads, and 1,140 m south of Manchester Road. The site is situated on a ridge top. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts

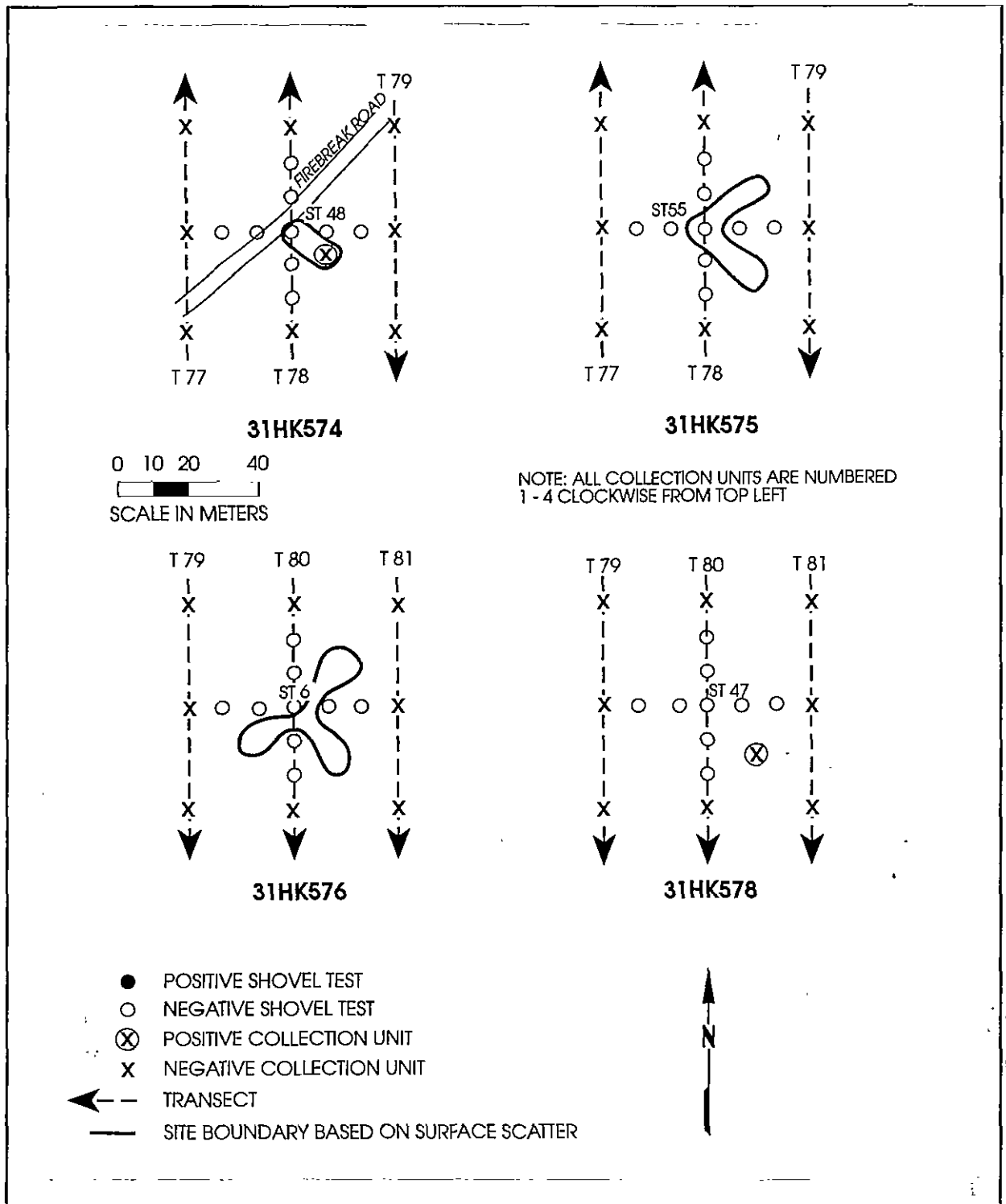

Figure 48. Maps of isolated sites 31HK574* - 31HK578*.

were collected in a 60 m east-west by 60 m north-south area. The surface collection from this area recovered a total of one artifact.

Collection Unit 3 yielded one quartz Yadkin projectile point. This point measures 115.43 mm in length, 13.62 mm in width and 3.76 mm in thickness. It was collected approximately 5 m southeast of ST22 on T93 (Figure 48). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3892115 E656540.

31HK581*

Site 31HK581* is a lithic scatter located 150 m west of the intersection of Longstreet and Manchester roads, and 1,050 m south of Manchester Road. The site is situated on a ridge top. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered one specimen.

Collection Unit 4 yielded one secondary quartz flake. This was collected approximately 5 m southwest of ST35 on T94 (Figure 48). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891520 E656520.

31HK582*

Site 31HK582* is a lithic scatter located 150 m west of the intersection of Longstreet and Manchester roads, and 780 m south of Manchester Road. The site is situated on a ridge top. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of four artifacts.

Collection Unit 1 yielded one metavolcanic biface and one used metavolcanic flake. The biface measures 43.04 mm in length, 34.65 mm in width and 7.59 mm in thickness. Collection Unit 4 yielded one interior metavolcanic flake and one interior used metavolcanic flake. These were collected west of ST26 on T94 (Figure 48). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the 11 shovel tests yielded any artifacts. The central UTM coordinates of this occurrence are N3891790 E656535.

31HK583*

Site 31HK583* is a lithic scatter located 630 m south of the intersection of Longstreet and Manchester roads. The site is situated on a ridge top where vegetation is sparse grass and surface visibility is 75 to 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of three artifacts.

Collection Unit 1 yielded one interior metavolcanic flake. Collection Unit 3 yielded one interior metavolcanic flake. Collection Unit 4 yielded the central portion of a metavolcanic biface. All were collected within a 30 m radius of ST21 on T99 (Figure 49). Close interval testing, in cardinal directions, was performed at 15 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891710 E656645.

31HK584*

Site 31HK584* is a lithic scatter located 720 m south of the intersection of Longstreet and Manchester roads. The site is situated on a ridge

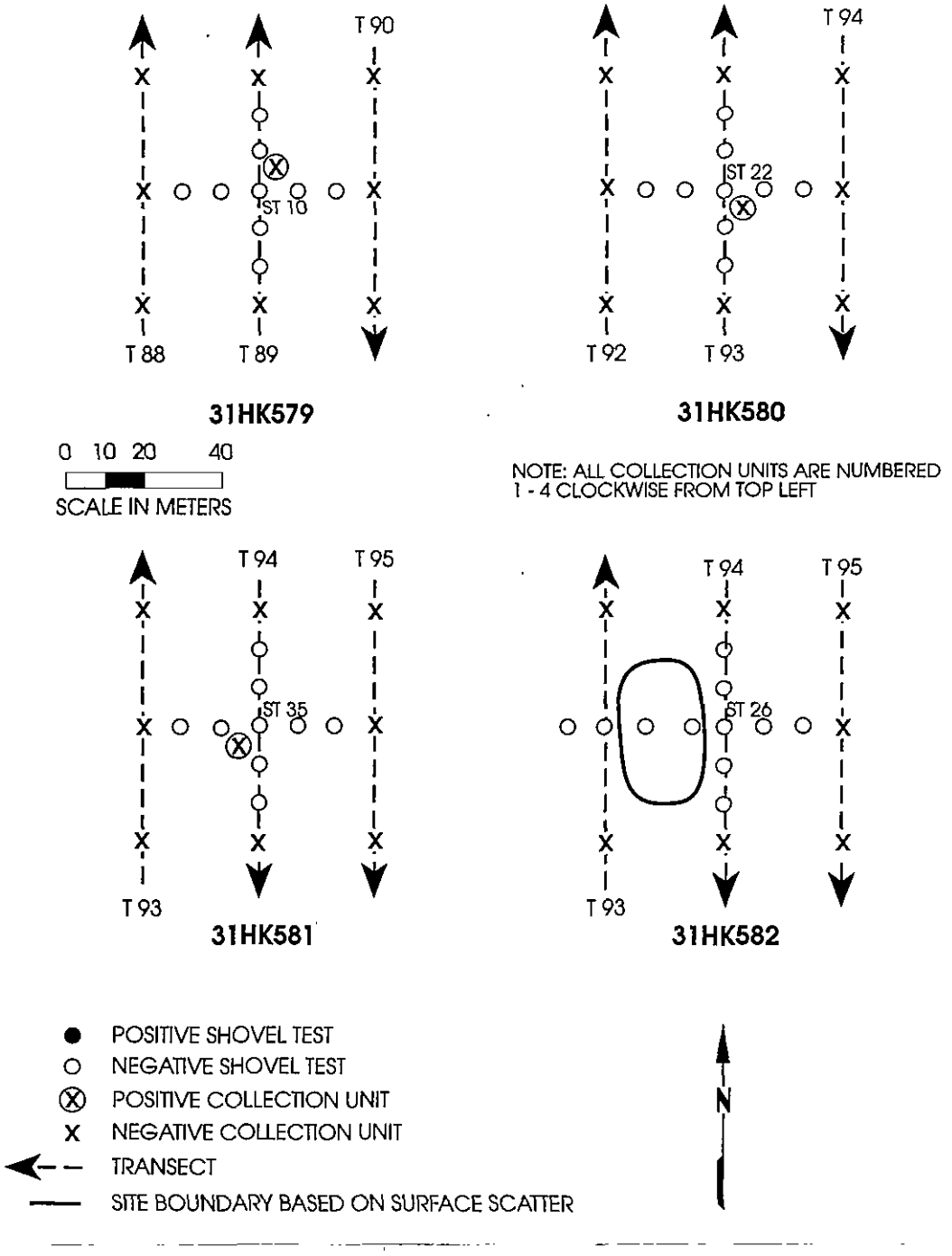

Figure 49. Maps of isolated sites 31HK579* - 31HK582*.

top. Vegetation at the site is sparse grass and surface visibility is 75 to 100%.

Normally a controlled surface collection, using a numerically designated 30 m grid, would have been made at this site. They would have been collected in a 60 m east-west by 60 m north-south area. Unfortunately, prior to testing, military operations destroyed the site. The initial surface collection from this area recovered a total of one artifact.

Collection Unit 2 yielded one metavolcanic biface. This was collected within a 30 m radius of ST24 on T99 (Figure 49). The biface measures 51.29 mm in length, 40.64 mm in width and 9.72 mm in thickness. Close interval testing, in cardinal directions, was not performed at this site due to its disturbed condition. The central UTM coordinates of this occurrence are N3891640 E656660.

31HK586*

Site 31HK586* is a lithic scatter located 90 m east of the intersection of Longstreet and Manchester roads, and 720 m south of the eastern boundary fire break road. The site is situated upon a ridge slope. Vegetation at the site is sparse grass and surface visibility is 100%.

Although a controlled surface collection was made using a numerically designated 30 m grid, the northern portion of the site was destroyed during military operations. This also eliminated the collection of artifacts from grid square locations which would have extended from ST23 on T102. Thus, artifacts were only collected in a 60 m east-west by 60 m north-south area extending from ST24 on T102. The surface collection from this area recovered a total of four specimens.

Collection Unit 1 yielded one interior metavolcanic flake and one interior quartz flake. Collection Unit 4 yielded one interior metavolcanic flake and one primary quartz flake. These were collected approximately 15 m southeast of ST24 on T102 (Figure 49). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891560 E656770.

31HK587*

Site 31HK587* is a lithic scatter located 90 m east of the intersection of Longstreet and Manchester roads, and 600 m south of the eastern boundary fire break road. The site is situated on a ridge slope. Vegetation at the site is sparse grass and surface visibility is 100%.

Although a controlled surface collection was made using a numerically designated 30 m grid, the southern portion of the site was destroyed during military operations. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one artifact.

Collection Unit 2 yielded one interior quartz flake. This was collected 15 m northeast of ST20 on T102 (Figure 49). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891680 E656780.

31HK588*

Site 31HK588* is a lithic scatter located 120 m east of the intersection of Longstreet and Manchester roads, and 510 m south of the eastern boundary firebreak road. The site is situated on a ridge top. Vegetation at the site is sparse grass and surface visibility is 100%.

Although a controlled surface collection was made using a numerically designated 30 m grid, the southern portion of the site was destroyed during military operations. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered a total of one specimen.

Collection Unit 1 yielded one interior quartz flake. This was collected 10 m northwest of ST217 on T103 (Figure 50). Close interval testing, in cardinal directions, was performed at 10

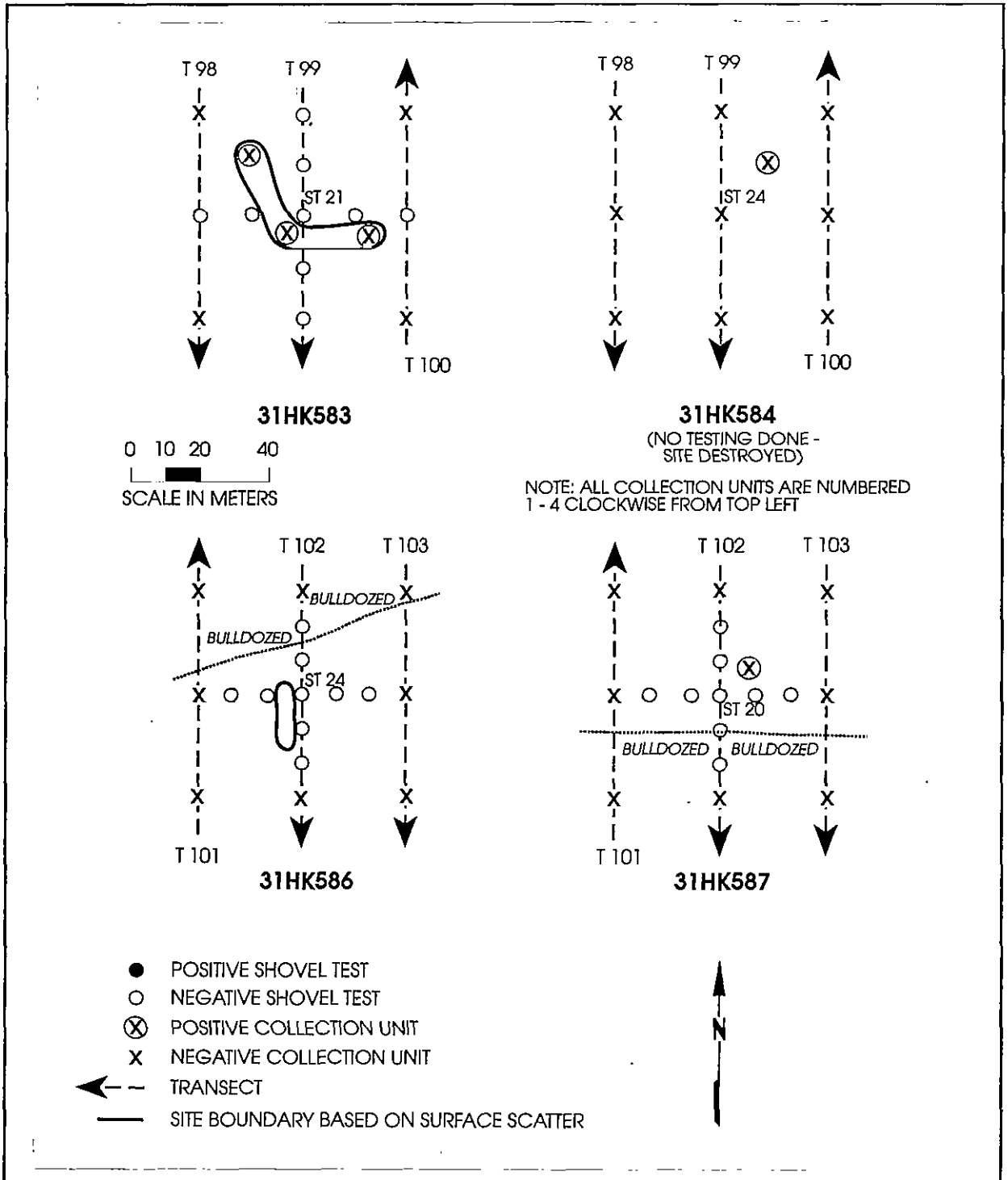

Figure 50. Maps of isolated sites 31HK583* - 31HK587*.

m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3891740 E656810.

31HK589*

Site 31HK589* is a lithic scatter located 30 m east of the intersection of Longstreet and Manchester roads, and 510 m south of the eastern boundary Fire Break road. The site is situated on a ridge toe. Vegetation at the site is sparse to thick grass and surface visibility is approximately 10 to 60%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area or approximately 3,600 m^2. The surface collection from this area recovered four artifacts.

Collection Unit 3 yielded two interior quartz flakes. Collection Unit 4 yielded two quartz shatter fragments. These were collected approximately 10 to 15 m south of ST37 on T100 (Figure 50). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3892290 E656740.

31HK592*

Site 31HK592* is lithic scatter located 120 m west of the intersection of Longstreet and Manchester roads, and 540 m south of Manchester Road. The site is situated on a ridge toe which slopes to the north. Vegetation at the site is non-existent and surface visibility is 100%.

A controlled surface collection was made using a numerically designated 30 m grid. Artifacts were collected in a 60 m east-west by 60 m north-south area. The surface collection from this area recovered a total of two specimens.

Collection Unit 4 yielded one secondary metavolcanic flake and one secondary quartz flake. These were collected approximately 5 m southwest of ST18 on T95 (Figure 50). Close interval testing, in cardinal directions, was performed at 10 m intervals. None of the nine shovel tests yielded any additional artifacts. The central UTM coordinates of this occurrence are N3892000 E656560.

Unlocated Sites

A number of the sites which were identified by Bartlett (1967) and Loftfield (1979) could not be relocated during this survey. This is possibly due to one or more reasons: 1) they have been destroyed; 2) they are covered with colluvium and could not be relocated with our shovel tests; 3) they were not accurately located by the previous survey and actually correspond with one of our new sites or new occurrences, or 4) they have been entirely collected. Nonetheless, descriptions given by Bartlett and Loftfield are provided. As unlocated sites, we recommend all of these sites as not eligible for inclusion of the National Register. No further work is recommended at any of these locations.

31HK5*

Site 31HK5* was described by Bartlett as being located on the east side of Railroad Ridge (Holland) Drop Zone at the head of Piney Bottom Creek. Surface collected were one Kirk Serrated projectile point and one projectile point fragment. No subsurface testing was performed and no additional work was recommended (NC Site Form 31HK5, 1967).

31HK6*

Site 31HK6* was described by Bartlett as being located on the southeast side of Railroad Ridge, along a south facing ridge 402 m east of the landing strip. Surface collected were one triangular projectile point. No subsurface testing was performed and no additional work was recommended (NC Site Form 31HK6, 1967).

31HK17*

Site 31HK17* was described by Loftfield (1979) as being approximately 150 m northwest of the southeast Holland Drop Zone border road and

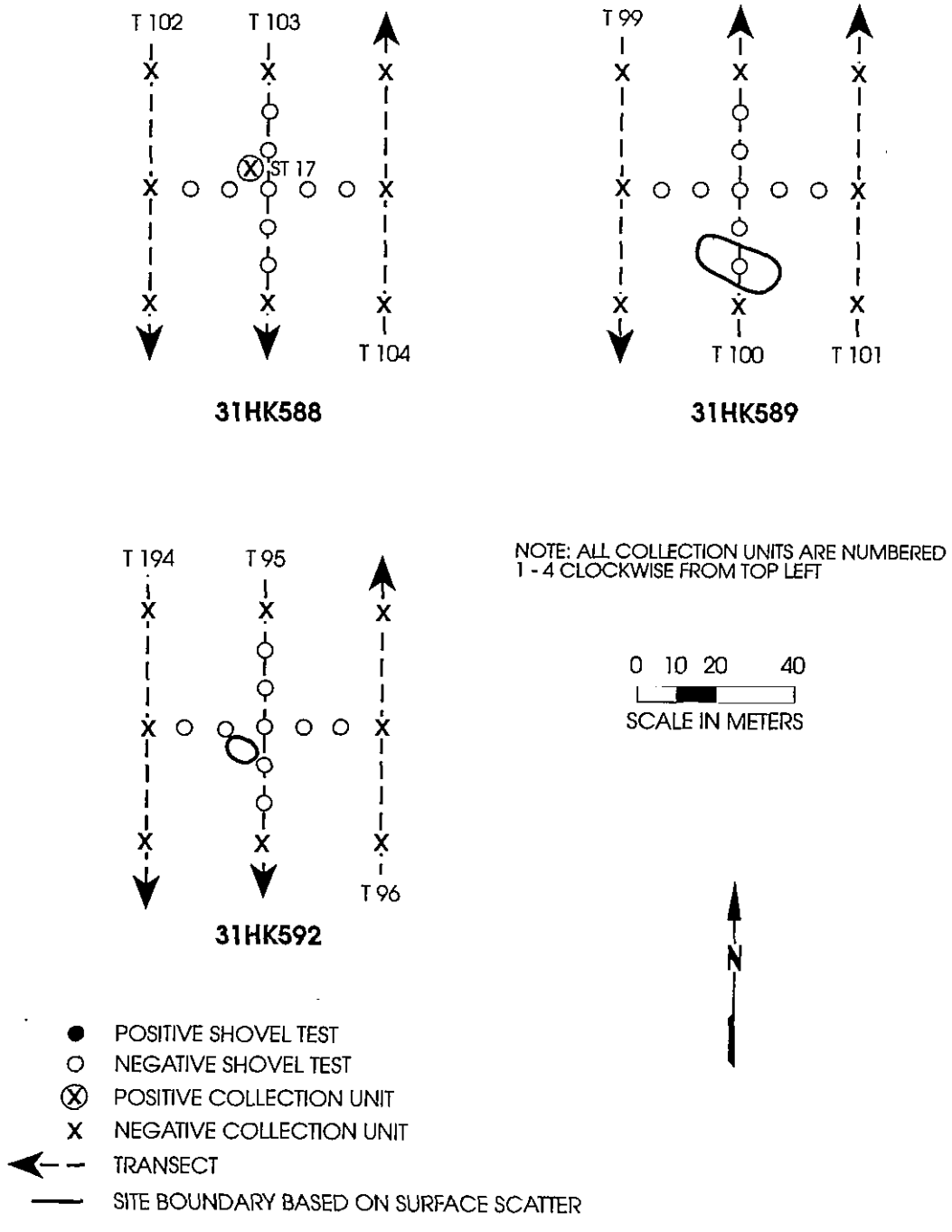

Figure 51. Maps of isolated sites 31HK588* - 31HK592*.

approximately 950 m northeast of the southwest Holland Drop Zone border road on the west side of the first drainage east of the southwest border of the drop zone. Surface collected were 28 flakes. Classified as a nondiagnostic prehistoric site, no subsurface testing was performed and no additional work was recommended (Loftfield 1979:G-3).

31HK18*

Site 31HK18* was described by Loftfield (1979) as being approximately 250 m northwest of the southeast Holland Drop Zone border road and approximately 950 m northeast of the southwest Holland Drop Zone border road on the west side of the first drainage east of the southwest border of the drop zone. Surface collection yielded a total of 25 artifacts. These included 17 sherds (15 grit-tempered and two sherd-tempered) along with eight flakes. Classified as a Woodland Period site, no subsurface testing was performed and no additional work was recommended (Loftfield1979:G-4).

31HK19*

Site 31HK19* was described by Loftfield (1979) as being situated approximately 1,100 m northeast of the southwestern Holland Drop Zone border road and approximately 350 m north of the southeastern Holland Drop Zone border road. Surface collection yielded a total of 110 artifacts. These included one scraper, two biface fragments and 107 flakes. Classified as an nondiagnostic prehistoric site, no subsurface testing was performed and no additional work was recommended (Loftfield 1979:G-4).

31HK20*

Site 31HK20* was described by Loftfield (1979) as being located approximately 1,400 m northeast of the southwestern Holland Drop Zone border road and approximately 650 m northwest of the southeastern Holland Drop Zone border road on top of Railroad Ridge approximately 150 to 175 m west of the second drainage. Surface collection yielded a total of 42 artifacts. These included two knives and 40 flakes. Classified as an nondiagnostic prehistoric site, no subsurface testing was performed and no additional work was recommended (Loftfield 1979:G-4).

31HK21*

Site 31HK21* was described by Loftfield (1979) as being located approximately 1,000 m northeast of the southwestern Holland Drop Zone border road and approximately 2,300 m northwest of the southeastern Holland Drop Zone border road approximately 280 m north of the fourth drainage. Surface collection yielded one quarry blade. Classified as an nondiagnostic prehistoric site, no subsurface testing was performed and no additional work was recommended (Loftfield 1979:G-4).

31HK22*

Site 31HK22* was described by Loftfield (1979) as being located approximately 850 m northeast of the southwestern Holland Drop Zone border road and approximately 2,250 m northwest of the southeastern Holland Drop Zone border road and approximately 300 m northeast of the fourth drainage. Surface collection yielded one Guilford projectile point. Classified as a Middle Archaic site, no subsurface testing was performed and no additional work was recommended (Loftfield 1979:G-4).

CONCLUSIONS

Introduction

As a result of the intensive survey of the 625.73 ha Holland Drop Zone and the 243.81 ha Fort Bragg general survey, 43 archaeological sites were recorded or revisited — all in the Holland Drop Zone survey tract. No sites were identified in any of the other survey tracts examined during this study. Of the 43 identified sites, 31 were isolated occurrences. Table 9 lists the sites currently identified. Of the resources recovered, one site, 31HK23*, is recommended as potentially eligible for inclusion on the National Register of Historic Places. None of the other 42 are recommended as eligible for inclusion on the National Register of Historic Places.

The Holland Drop Zone survey tract, which was primarily deforested with excellent surface visibility, yielded a site density of 6.8 sites per km² when both sites and isolated occurrences are considered. The site density declines to 1.9 sites per km² if the isolated occurrences are discounted.

Over the past two years Chicora Foundation has explored 2,289.4 ha or 23 km² on six different tracts (Trinkley et al. 1996a, 1996b, 1996c, and this current study). Although this represents only 3.8% of the total Fort Bragg installation (of ca. 60,000 ha) and while the survey tracts do not represent strictly random parcels incorporating a cross section of the Fort Bragg topography and environmental zones, the survey methodology has been remarkably consistent. The studies have been conducted under only two different field directors and all of the work has used essentially identical methodologies for site identification. In other words, while the sample is small and we cannot represent it as statistically valid, the data have nevertheless been carefully collected. It is therefore appropriate to explore

Table 9.
Sites in the Holland Drop Zone

Site #	Current Status	Site #	Current Status
31HK5*	NE - not relocated	31HK566	NE
31HK6*	NE - not relocated	31HK567*	NE - occurrence only
31HK17*	NE - not relocated	31HK568*	NE
31HK18*	NE - not relocated	31HK569*	NE - occurrence only
31HK19*	NE - not relocated	31HK570*	NE
31HK20*	NE - not relocated	31HK571*	NE - occurrence only
31HK21*	NE - not relocated	31HK572*	NE - occurrence only
31HK22*	NE - not relocated	31HK573*	NE
31HK23*	PE	31HK574*	NE - occurrence only
31HK550*	NE - occurrence only	31HK575*	NE - occurrence only
31HK551*	NE - occurrence only	31HK576*	NE - occurrence only
31HK552*	NE - occurrence only	31HK577*	NE
31HK553*	NE - occurrence only	31HK578*	NE - occurrence only
31HK554*	NE - occurrence only	31HK579*	NE - occurrence only
31HK555*	NE - occurrence only	31HK580*	NE - occurrence only
31HK556*	NE - occurrence only	31HK581*	NE - occurrence only
31HK557*	NE - occurrence only	31HK582*	NE - occurrence only
31HK558*	NE - occurrence only	31HK583*	NE - occurrence only
31HK559*	NE - occurrence only	31HK584*	NE - occurrence only
31HK560*	NE - occurrence only	31HK585*	NE
31HK561*	NE	31HK586*	NE - occurrence only
31HK562*	NE	31HK587*	NE - occurrence only
31HK563*	NE	31HK588*	NE - occurrence only
31HK564*	NE	31HK589*	NE
31HK565*	NE - occurrence only	31HK591*	NE
		31HK592*	NE - occurrence only

PE = potentially eligible, NE = not eligible

what these data may be able to tell us about site density at Fort Bragg. Table 10 provides an overview of the different tracts.

When both sites and isolated occurrences are considered, we find that the site density ranges from a low of about 3.2 to 3.3 sites per km² (found on two different surveys) to a high of 22.4 sites per km² (found on only one survey tract). The standard deviation is 6.7 sites and the mean of the different surveys is 8.1 sites per km² (although if all of the surveys were combined, the mean would be slightly higher — 9.4 sites per km²).

In comparison, Loftfield (1979) projected an average density of 10 sites per km² while Abbott et al. (1995:35) suggested a density of 11.3 sites per km² and Braley (1989b) found a density of 16.1 sites per km² in the Northern Training Area.

Table 10.
Site Density from Chicora Surveys on Fort Bragg

Project	Ha	Km²	Sites	Sites/km²	Isos	Combined Sites/km²
Sicily DZ	557.5	5.6	40	7.2	85	22.4
Camp Mackall DZ	230.0	2.3	14	6.5	4	8.3
Manchester Road	70.0	0.7	2	2.9	1	4.3
Camp Mackall SF	29.6	0.3	1	3.3	-	3.3
Ft. Bragg General	776.6	7.8	10	1.3	15	3.2
Holland DZ	625.7	6.3	12	1.9	31	6.8
Combined Totals	2289.4	23.0	81	3.5	136	9.4

Standard Deviation on Combined Sites/km² - 6.7
Mean Combined Sites/km² - 8.1

Without reading too much into these data, we believe that they suggest there is considerable variation in the site density in the Fort Bragg area — so much so that it is probably misleading to use any one figure and attempt to represent it as applying to the entire area. We suspect that the density of sites across the Sand Hills is largely dependent on a variety of micro-environmental variables, some of which have been recognized and others of which we are probably ignorant.

We have previously suggested that one very significant micro-environmental factor is the presence of broad level areas on ridge side slopes overlooking small, intermittent drainages. These areas were particularly favored, while broad upland areas (which comprise much of the acreage surveyed thus far) were generally avoided (see Trinkley et al. 1996c:116).

All of the sites encountered in the current survey contain only prehistoric assemblages. No historic materials were encountered. This, however, is not particularly surprising. The 217 sites thus far examined by Chicora's surveys have produced 220 assemblages. Of these, 212 were prehistoric (representing 96.4%), while only eight sites yielded historic remains (representing 3.6%). This tends to support the historical overview which points out that the Sand Hills were not densely settled and through time farming became harder and seemingly less profitable. Most of the historic assemblages suggest small tenant occupations or perhaps even twentieth century refuse disposal. We have yet to identify a well preserved eighteenth or nineteenth century settlement.

Issues discussed in these conclusions include site attrition, site size and identification, prehistoric land use, site density, lithic resource use, artifacts, and general recommendations.

Site Attrition

Previous studies conducted at Camp Mackall (Trinkley et al. 1996b:102-106) and at Fort Bragg (Trinkley et al. 1996a:136-139, Trinkley et al. 1996c:117-118) have pointed out the extraordinary attrition of archaeological resources present in the Fort Bragg — Camp Mackall area. The causes for

this attrition have concentrated on human intervention, especially the collection of exposed materials, and the severe erosion that has been seen in the open and desert-like conditions of the Sicily and Camp Mackall drop zones. Work in the wooded areas of Fort Bragg has revealed that the impact of human intervention is not a significant issue, although site erosion continues to be severe throughout the base, even in these wooded and seemingly "preserved" areas (see Trinkley et al. 1996c:118).

Table 11.
Sites Sizes in Fort Bragg Drop Zones

Project	Range in Size (m²)	Mean Size (m²)	SD
Holland DZ	25 - 26,100	5,671	7,640
Camp Mackall DZ	80 - 21,600	3,287	5,411
Sicily DZ	52 - 37,575	3,497	6,705

The current study continues to confirm these previous observations. The Holland Drop Zone, another denuded parcel subjected to extraordinarily heavy use, exhibits a variety of site remnants characterized by, at best, truncated soil profiles. Of the 43 loci of artifacts, only 12 or less than a third, exhibited sufficient density to be called sites — the remainder were isolated finds. This is nearly identical to the ratio at Sicily Drop Zone. And while no sites were identified in the nearly 243 ha which were forested, the shovel test logs continue to reveal staggering amounts of soil loss, much of which must have occurred prior to the military's arrival in the early-twentieth century.

As found in earlier studies, the single most common factor weighing against the eligibility of archaeological sites continues to be the lack of site integrity, attributable to soil loss or erosion. This problem is caused by a combination of the nature of the soils, soil loss due to impacts of logging operations within the base boundaries, past cultivation practices, and the nature of the military operations which take place on the bases.

Site Size and Identification

The three drop zones have produced sites with very similar ranges in size, mean sizes, and standard deviations (see Table 11). In spite of this, the current study, at the Holland Drop Zone, yielded sites that were larger than most, having a mean size about 2,000 m² larger than found in either the Sicily or Camp Mackall drop zones. This is further confirmed when we realize that only two or 16.7% of the Holland Drop Zones are smaller than 1,000 m², compared to 46.7% of those in the Camp Mackall Drop Zone and 57.5% of those in the Sicily Drop Zone.

In the past we have made very strong cases for the Sicily and Camp Mackall drop zones that the cleared conditions allowed for a much more thorough recovery of the entire range of sites, many of which would never have been discovered through traditional shovel testing. The Holland Drop Zone presents us with a slightly different picture — a lower site density, but sites that are, on average, somewhat larger.

The safest conclusion is probably that with only three denuded tracts, totaling only 1413 ha, it isn't appropriate to make generalizations. The Holland Drop Zone may be anomalous or it may reflect thus far unrecognized micro-environmental variables. If we take all three drop zones together, we find a range of site sizes from 25 m² to nearly 38,000 m² and a mean of 3,840 m² and a standard deviation of 6,677. Nearly 48% of the sites (32 of 67) are less than 1,000 m² in size. Consequently, we would still expect a vast number of these sites — nearly one out of every two — not to be recovered in traditional shovel testing. This number, of course, would dramatically increase if we added the isolated occurrences to our examination. In this scenario, at least 81.3% of the loci would not have been recovered using traditional archaeological techniques.

We continue to point this out since we feel it is important for archaeologists to recognize the limitations of their data collection techniques, especially when they use their resulting data to create "models" for settlement and resource utilization. It seems likely that we typically see only

a small proportion of the total number of human occupations in any given area. If, in fact, we are creating our models on perhaps as few as 20% of the sites present, then we must consider the possibility that our understanding is, at best, flawed and, at worst, entirely wrong.

Prehistoric Land Use

The ability of this study, in and of itself, to offer detailed observations on prehistoric land use is constrained by the relatively small number of sites encountered and a general lack of diagnostic artifacts. If isolated occurrences are excluded, we have identified seven temporal components from the 12 sites (63.6%). Of these seven components, three are Archaic and four are Woodland. If we consider both the sites and the isolated occurrences then the number with temporally diagnostic components declines dramatically—only a quarter exhibit artifacts definitive of a particular period (five Archaic and six Woodland).

Like previous survey tracts, the Holland Drop Zone reveals sites situated primarily on the ridge side slopes overlooking small and intermittent drainages. As we move up, off the slopes, toward to the central ridge running northeast-southwest through drop zone tract, the number of sites decreases.

Those sites present in the broad uplands, not closely associated with any drainage, include 31HK554, 31HK557, 31HK558, 31HK559, 31HK560, 31HK565, 31HK567, 31HK574, 31HK577, 31HK578, 31HK580, 31HK585, 31HK589, and 31HK592. Of these, two (14.3%) are sites, while the remaining 12 (85.7%) are isolated occurrences. Even the two sites have very low densities (7 artifacts in 50 m^2 and 10 artifacts in 1,400 m^2). But perhaps more telling, only two of the 12 sites (or 16.7%) are found in this upland area, while 12 of the 31 isolated occurrences (38.7%) are found here. This suggests that the uplands were rarely used and when people did venture onto the sandy ridges, there were only small groups there for short periods. The general absence of diagnostic materials in the uplands, coupled with these other data, suggest that these upland sites may represent special activities, such as butchering sites or perhaps even stations where points were resharpened or rehafted in the midst of the hunt.

The Sicily Drop Zone data provide an almost identical picture, with only six of the 35 upland loci representing sites (17.1%). The remainder (82.9%) are isolated occurrences. Like the Holland Drop Zone, the sites which are present on the broad upland ridges have low artifact densities. And again, while only 15% of the sites are found in this ecozone, over a third (34.1%) of the isolated occurrences are found here.

Table 12 compares the percentage of sites on different slope faces for the Sicily, Camp Mackall, and Holland drop zones. Most sites are found on east facing slopes in the Sicily and Holland drop zones, although sites are most common on south facing slopes at the Camp Mackall Drop Zone.

Table 12.
Slope Faces for Sites in Drop Zones on Fort Bragg

Slope Face	% Sicily	% Camp Mackall	% Holland
N	11.8	9.1	30.0
NE	8.8	-	10.0
E	29.4	18.2	40.0
SE	23.5	18.2	-
S	2.9	45.4	-
SW	-	9.1	-
W	5.9	-	10.0
NW	17.6	-	10.0

Hudson (1984) notes that the prevailing winds in the Fort Bragg area are from the southwest. Only in the Camp Mackall area are any sites found on southwest facing slopes, so there seems to be some desire to stay out of direct winds. As we have noted in the past, Brown and Morgan (1983:24) explain that there are a number of factors to consider when locating a camp site.

For instance, southern exposures, such as found in the Camp Mackall area, provide the longest lasting heat and light, while camps on east facing slopes, such as those so common in the Sicily and Holland drop zones, provide not only protection from the winds and blowing rains, but also provide quicker warmth during the morning hours.

The two general survey areas, of course, yielded no sites, in spite of the fact that both appear to include ridge slopes overlooking drainages. The failure to identify sites in these area may be the result of the relatively small size of the tracts, or because of their extensive disturbance. Careful attention to the topography also reveals that these tracts are dominated by fairly steep slopes (8-15%) with relatively few level areas suitable for camps.

Table 13.
Artifact Density (sites listed by increasing size)

Site	Components	Size (m^2)	Density (per m^2)
31HK577	Lithic	25	0.28
31HK573	Archaic	600	0.11
31HK585	Lithic	1,400	0.01
31HK566	Archaic/Woodland	1,500	0.02
31HK591	Lithic	1,575	0.01
31HK564	Woodland	1,800	0.02
	range in density — 0.01 - 0.28		
	mean — 0.08		
	SD — 0.08		
31HK561	Archaic	3,375	0.05
31HK562	Archaic/Woodland	3,500	0.01
31HK568	Lithic	3,575	0.01
31HK570	Lithic	7,000	0.01
31HK563	Lithic	17,600	0.02
31HK23	Archaic	26,100	0.08
	range in density — 0.01 - 0.08		
	mean — 0.03		
	SD — 0.03		

It seems likely that while the sites on Fort Bragg are heavily impacted by erosion and deflation, their most significant contribution to our understanding of past lifeways may be in this area of land use. As the samples increase over the next several years there is a very good chance that we will be able to offer some detailed discussions on how at least the gross topographic differences affected prehistoric activities.

Site Density and Function

Table 13 provides a list of the archaeological sites, their components, size in m^2, and the density of artifacts per m^2 listed in order of size. Sassaman et al. (1990) suggest that the density of artifacts at prehistoric sites is a useful measure of the relative intensity of material discard at a site. Sassaman et al. (1990) states that the amount of discard is assumed to be proportional to the "cumulative duration of site occupation, and/or the total number of site occupants, and/or the intensity of activities from which discarded debris was generated" (Sassaman et al. 1990:223). Lithic tool manufacture, however, generates a large volume of debris which creates a bias on measures of occupation duration/intensity and Sassaman and his colleagues recommend calculating density for total assemblages and for artifacts other than debitage. Unfortunately, too few artifacts other than debitage are present at these sites so density based only on the total assemblage could be calculated. They warn that artifact density should only be calculated for subsurface assemblages with an adequate sample size. None of these conditions exist at any of the sites encountered and both surface and subsurface assemblages are combined. Because of these problems, other types of site analysis such as tool to debitage ratio and assemblage diversity were determined to be inappropriate with the collection obtained during this survey.

An examination of Table 13 reveals several things. First, the smaller sites (given the small sample size, we have chosen to define these as under 2,000 m^2) have a relatively large range in artifact density from 0.01 to 0.28 artifacts per m^2. The mean density is 0.08, with a standard deviation of 0.08. While representing a low density, it is nevertheless higher than that found at sites greater

than 2,000 m², where the range is 0.01 to 0.08 artifacts per m² and the average is 0.03 (standard deviation is 0.03).

This pattern is nearly identical to that found in the Sicily Drop Zone study (Trinkley et al. 1996a:148), with even the mean density in the large sites being the same.

We have previously suggested that the smaller sites tend to have a higher artifact density since they were used primarily for lithic reduction, resulting in the production of large quantities of flakes congregated or disposed of in a relatively small area. The larger sites, with lower artifact density and a narrower range of variation, also exhibit a pattern previously observed at the Sicily Drop Zone.

Unfortunately, there is relatively little else that the data can tell us at this point. There were relatively few sites with diagnostic remains and those are evenly divided between the larger and smaller sites. Even the temporal episodes are identical in the two groups, with one site containing only Archaic materials, one site containing both Archaic and Woodland components, and a third site producing only Woodland materials.

The Holland Drop Zone did produce relatively few Woodland Period artifacts. Compared to the 12 Archaic projectile points, the survey tract yielded only five Woodland points, three Yadkin sherds, and 23 small sherds — a rather paultry assemblage.

Lithic Resource Use

The Holland Drop Zone is dominated by quartz, which accounts for 81.9% of the debitage recovered from the sites and 60.2% of all tools. Metavolcanics are, generally speaking, uncommon and seem to occur in somewhat isolated concentrations.

We have noticed in previous studies that the proportion of quartz and metavolcanic materials can be quite variable in the different study areas. These differences are briefly summarized for several of the previous Chicora studies in Table 14.

In general, it appears that those tracts on Fort Bragg proper (Sicily, Fort Bragg General Survey, and most recently, Holland) are dominated by quartz, while those further to the west, on Camp Mackall, exhibit a higher proportion of metavolcanic material. The most reasonable explanation for this difference in use may be distance to the raw material source. It was observed that while quartz in the form of river cobbles is locally available in the Fort Bragg area, the closest metavolcanic outcrop is found about 16 km to the west and the large Morrow Mountain quarry is located about 97 km away. In the Camp Mackall area there is no large drainage like the Little River to supply river cobbles, but the project area is considerably closer to metavolcanic rock outcrops, probably only about 6 km to the west. All other things being equal, this difference of 10 km may have been sufficient to encourage a reliance on quartz in the Fort Bragg area. If so, then this may help us to better understand the cost-benefit ratio of the two materials.

Table 14.
Raw Material Recovery on Various Survey Tracts

	Debitage		Tools	
Project	Q	M	Q	M
Sicily DZ	63.0	37.0	24.0	76.0
Camp Mackall DZ	22.1	77.9	5.7	94.3
Camp Mackall SF	34.6	65.4	-	-
Fort Bragg Gen Sur	46.7	53.3	-	-
Holland DZ	81.9	18.1	60.2	39.8

Q = quartz, M = metavolcanic

The Sicily Drop Zone study (Trinkley et al. 1996a:148-149) found that while metavolcanic flakes were uncommon, the vast majority of the formalized tools were produced from metavolcanic material. The explanation offered for this was that the prehistoric occupants of the area preferred metavolcanics for tools that were to be curated. This pattern, however, appears to break down in

the Holland Drop Zone, where about equal numbers of the projectile points were produced from quartz (n=13) and metavolcanics (n=12). One additional point was made from a siliceous chert. Other tool types are even more dramatically dominated by quartz — 23 of the bifaces are quartz, compared to eight made from metavolcanics and five of the scrapers are produced from quartz, compared to one of metavolcanic material. Only the category of used flakes is dominated by metavolcanics (eight compared to four of quartz), although this is likely a by-product of the difficulty of identifying use on a quartz edge.

At first glance it appears that the occupants of the Holland Drop Zone relied much more heavily on quartz than on metavolcanics — and this may be the case. Nevertheless, we can point out that while only 18% of the flakes were metavolcanic, this material accounts for nearly 40% of the tools. So metavolcanics were seemingly still in heavy demand for use as curated tools.

We also noted in the Sicily Drop Zone study that we found scrapers (normally considered a curated tool) commonly made of quartz, suggesting that they may have been viewed as expedient items made of locally available materials and discarded. This certainly appears to be the case at Holland as well. In addition, we note that bifaces were perhaps also not viewed as curated tools since so many seem to have been quickly chipped out of locally available quartz. Many of these tools, in fact, are very poorly made, suggesting little care or attention to their long-term use.

Artifacts

Sixteen projectile points, either whole or large enough fragments to be identifiable were recovered during this study (see Figures 51 - 52). As previously discussed, these are about evenly divided between quartz and metavolcanic materials. An additional nine unidentifiable fragments were also recovered. These are primarily nondiagnostic blade or tip fragments. These have a very similar proportion of quartz-metavolcanic usage as the intact points.

The identified points are dominated by Archaic forms — Palmer, Kirk, Morrow Mountain, Guilford, Savannah River, and Small Savannah River. All fall within, or very close to, the standard metric and morphological attributes outlined by Coe (1964) and Oliver (1981).

Other stone tools include the categories of bifaces, scrapers, a possible burin, and used flakes. Samples of these materials are illustrated in Figures 53 - 55.

Pottery was exceedingly uncommon in the current collection. Only three specimens were recovered and all were classified as Yadkin Fabric Impressed (Figure 56). An additional 23 specimens were classified as small (i.e., under 2.5 cm in diameter) unidentifiable sherds. No attempt has been made to type these materials because essential information on paste and surface treatment are difficult, or impossible, to obtain.

Recommendations

The site recommended as potentially eligible (31HK23*) should be monitored to ensure that the location is undisturbed. Situated in a drop zone setting, the site is at considerable risk from military operations. As previously outlined, this site should receive additional, intensive testing to determine its eligibility. This testing should focus on the discovery of subsurface remains, perhaps using a 5 meter test interval in those areas currently identified as exhibiting the densest concentration of materials. If intact soil horizons with cultural material can be found, it may be appropriate to conduct block excavations. Additional research design, however, should be based on the findings of the intensive testing.

Although there are other sites which will likely continue to produce small quantities of artifacts as the soils are disturbed or moved about, they are not recommended as eligible or potentially eligible for inclusion on the National Register of Historic Places. Consequently, no other

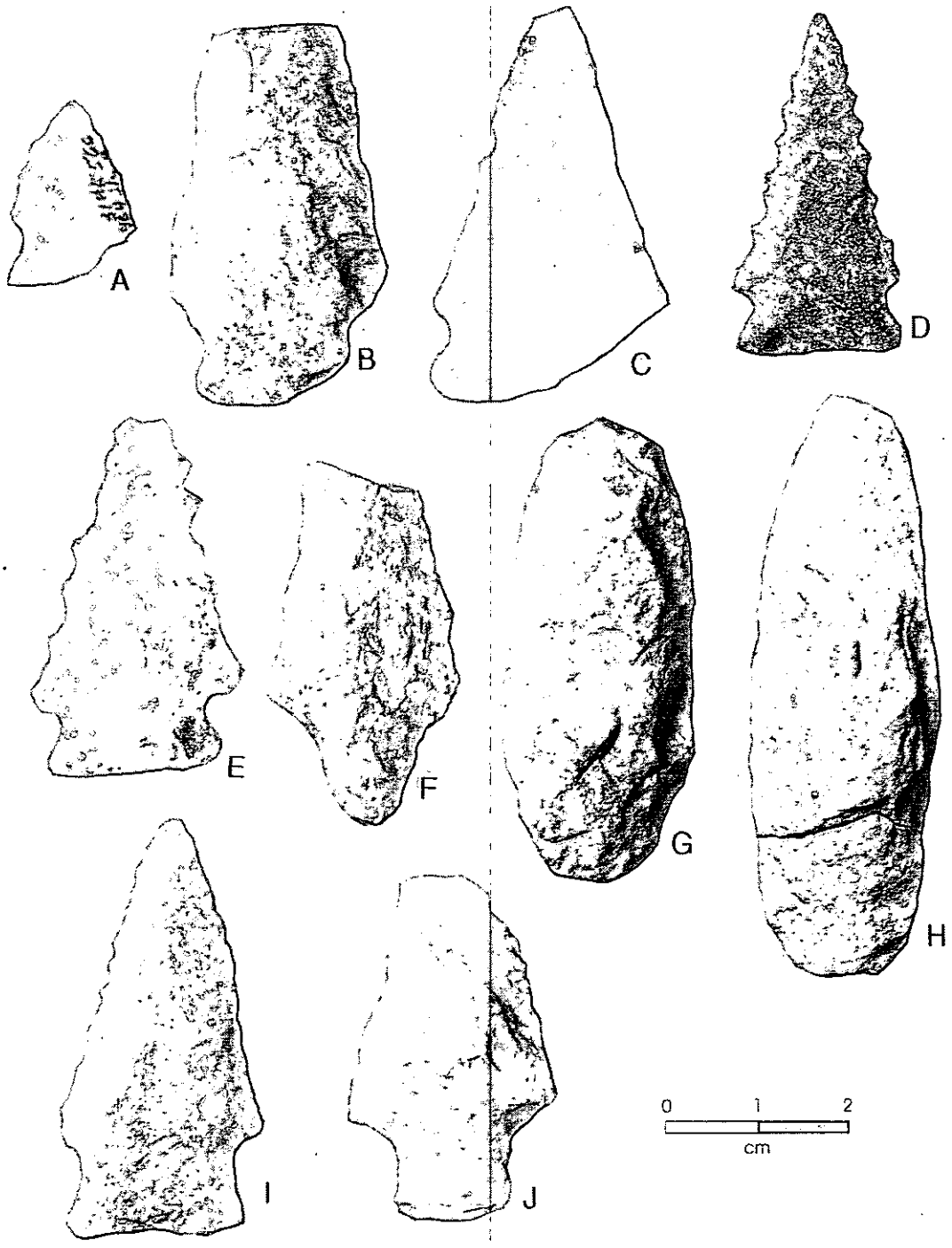

Figure 52. Projectile points. A, small Palmer Corner Notched (31HK566*); B, Palmer Corner Notched (31HK566*); C, Kirk Corner Notched (31HK551*); D-E, Kirk Serrated (31HK23*); F, Morrow Mountain II (31HK23*); G-H, Guilford Lanceolate (31HK562*, 31HK559*): I, Kirk Stemmed (31HK566*); J, Small Savannah River Stemmed (tip broken) (31HK562*).

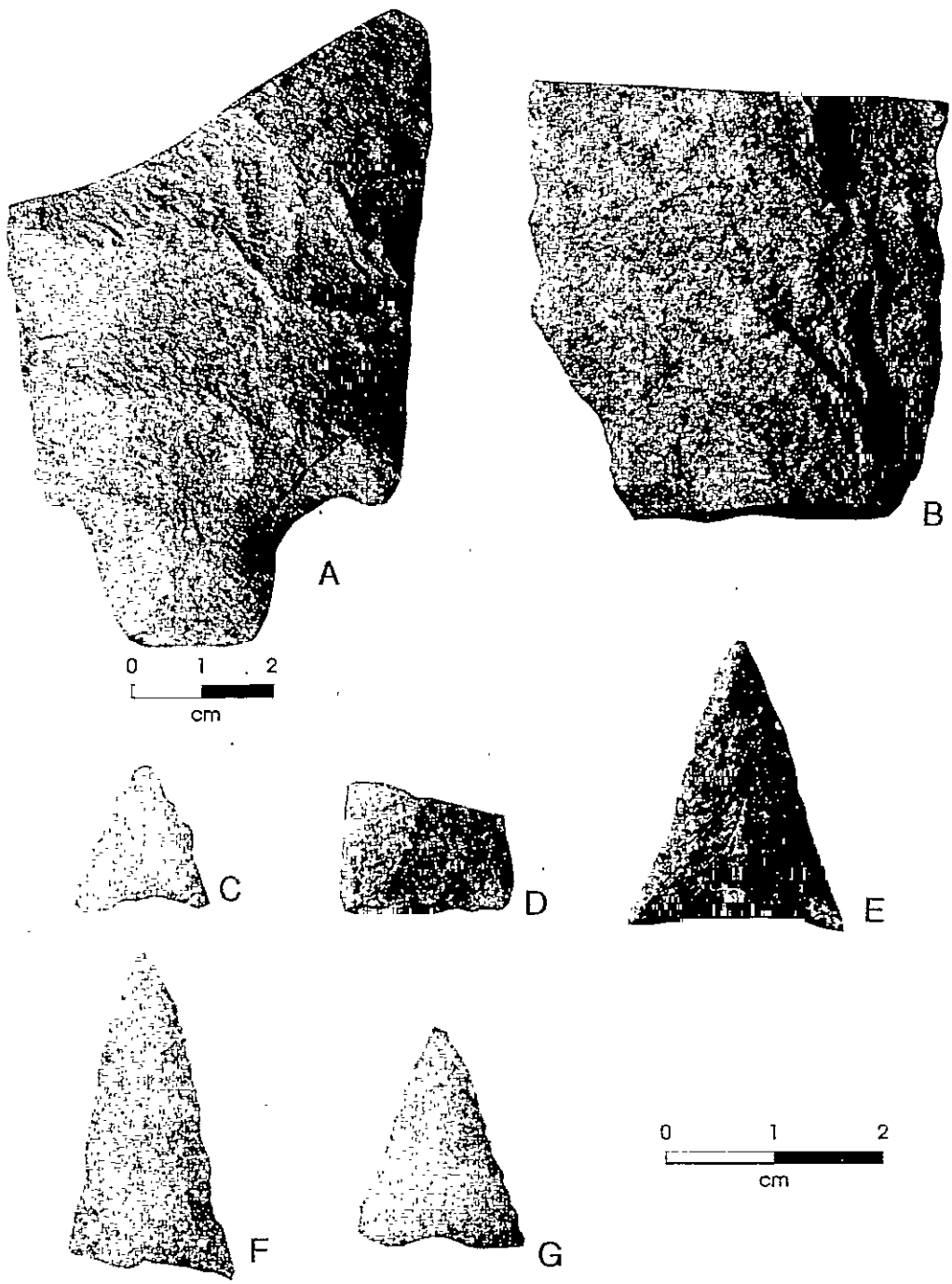

Figure 53. Project points. A-B, Savannah River Stemmed (31HK561*, 31HK556*); C, small Yadkin Triangular (31HK580*); D, Uwharrie Triangular base (31HK576*); E-G, Caraway Triangular (31HK566*, 31HK564*, 31HK572*).

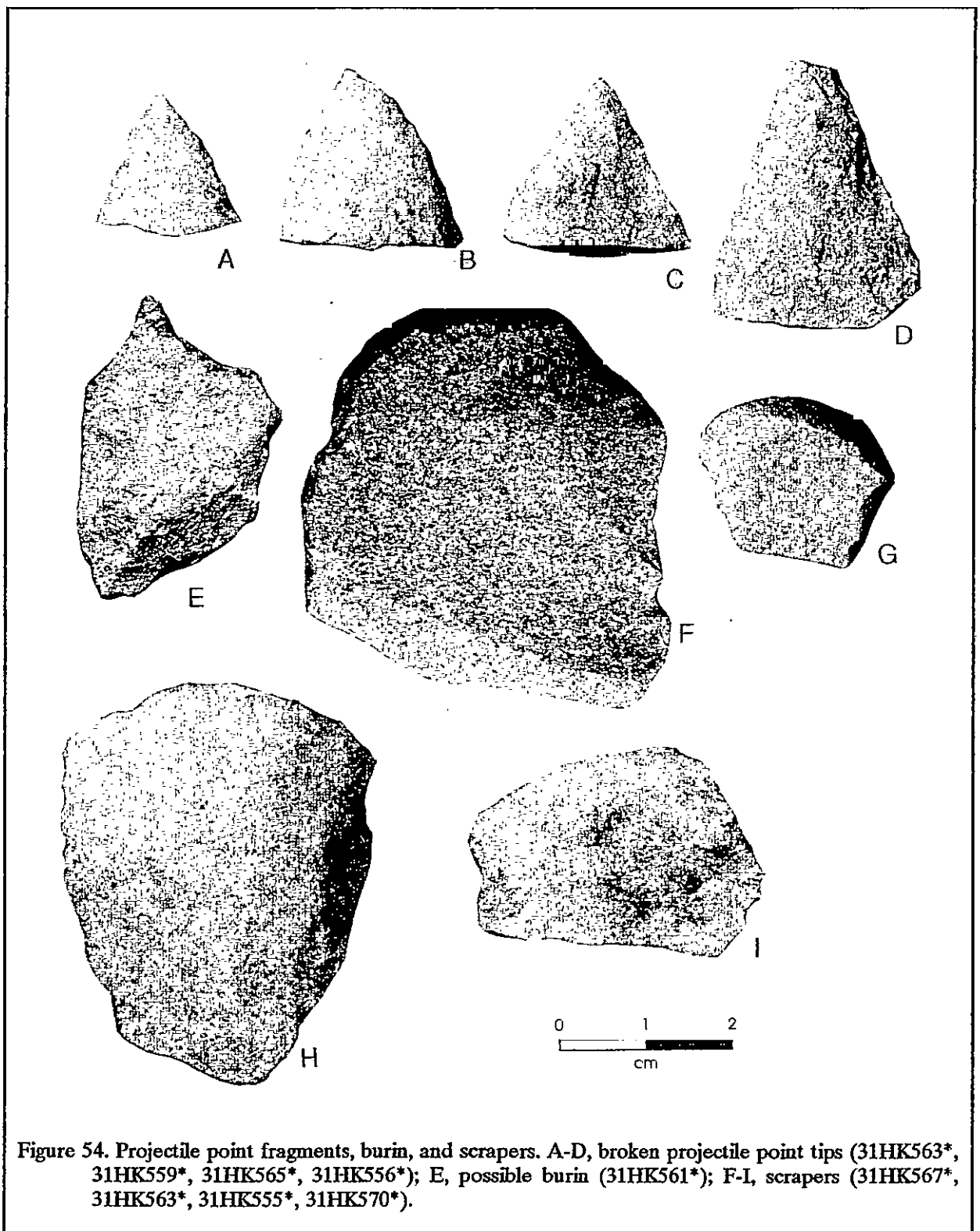

Figure 54. Projectile point fragments, burin, and scrapers. A-D, broken projectile point tips (31HK563*, 31HK559*, 31HK565*, 31HK556*); E, possible burin (31HK561*); F-I, scrapers (31HK567*, 31HK563*, 31HK555*, 31HK570*).

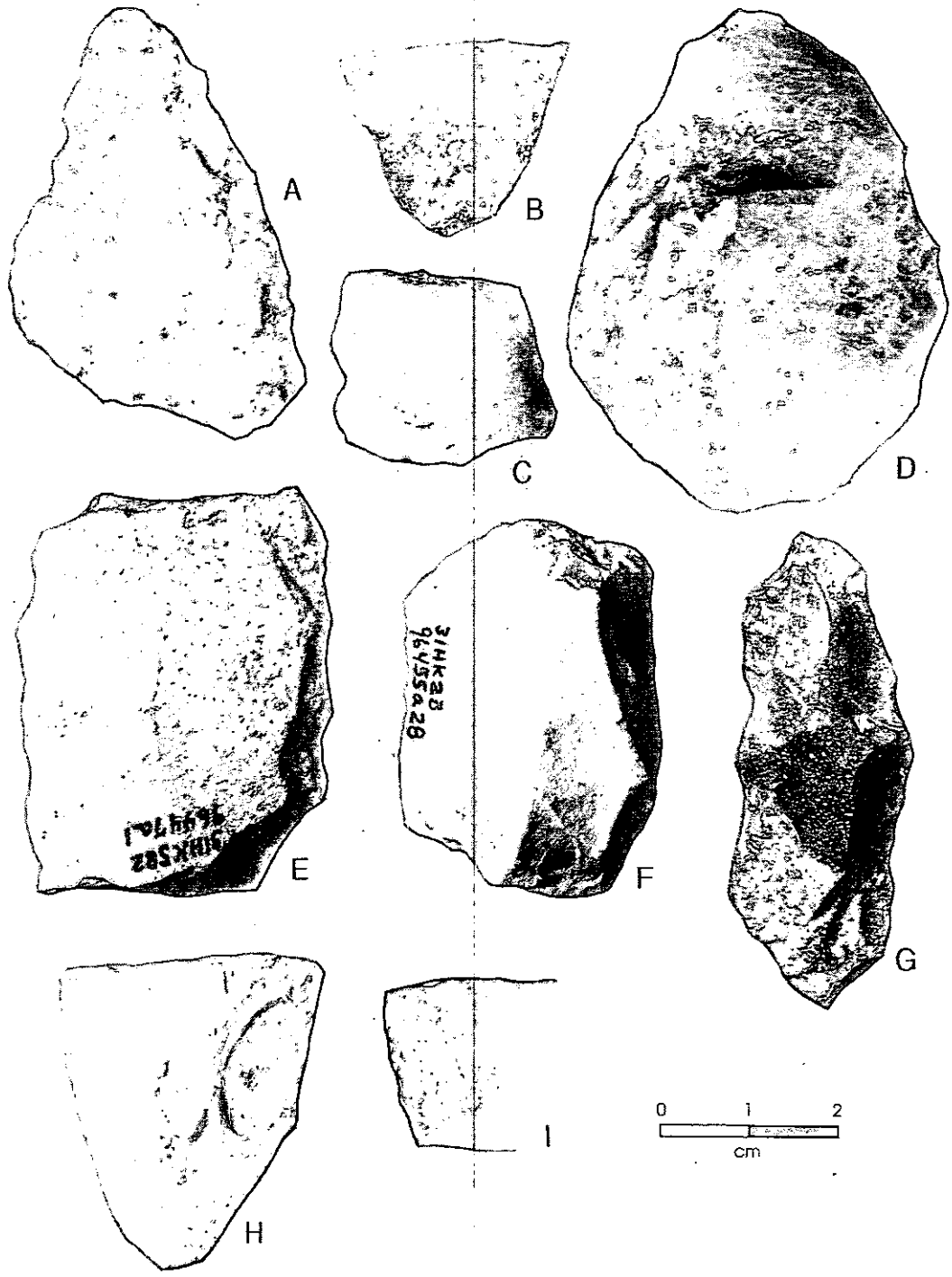

Figure 55. Bifaces. A-C, quartz biface fragments (31HK563*, 31HK573*, 31HK556); D, quartz biface (31HK563*); E-F, metavolcanic biface fragments (31HK582*, 31HK23*); G, biface of possibly non-local metavolcanic material (31HK573*); H-I, heavily weathered metavolcanic biface fragments (31HK570*, 31HK575*).

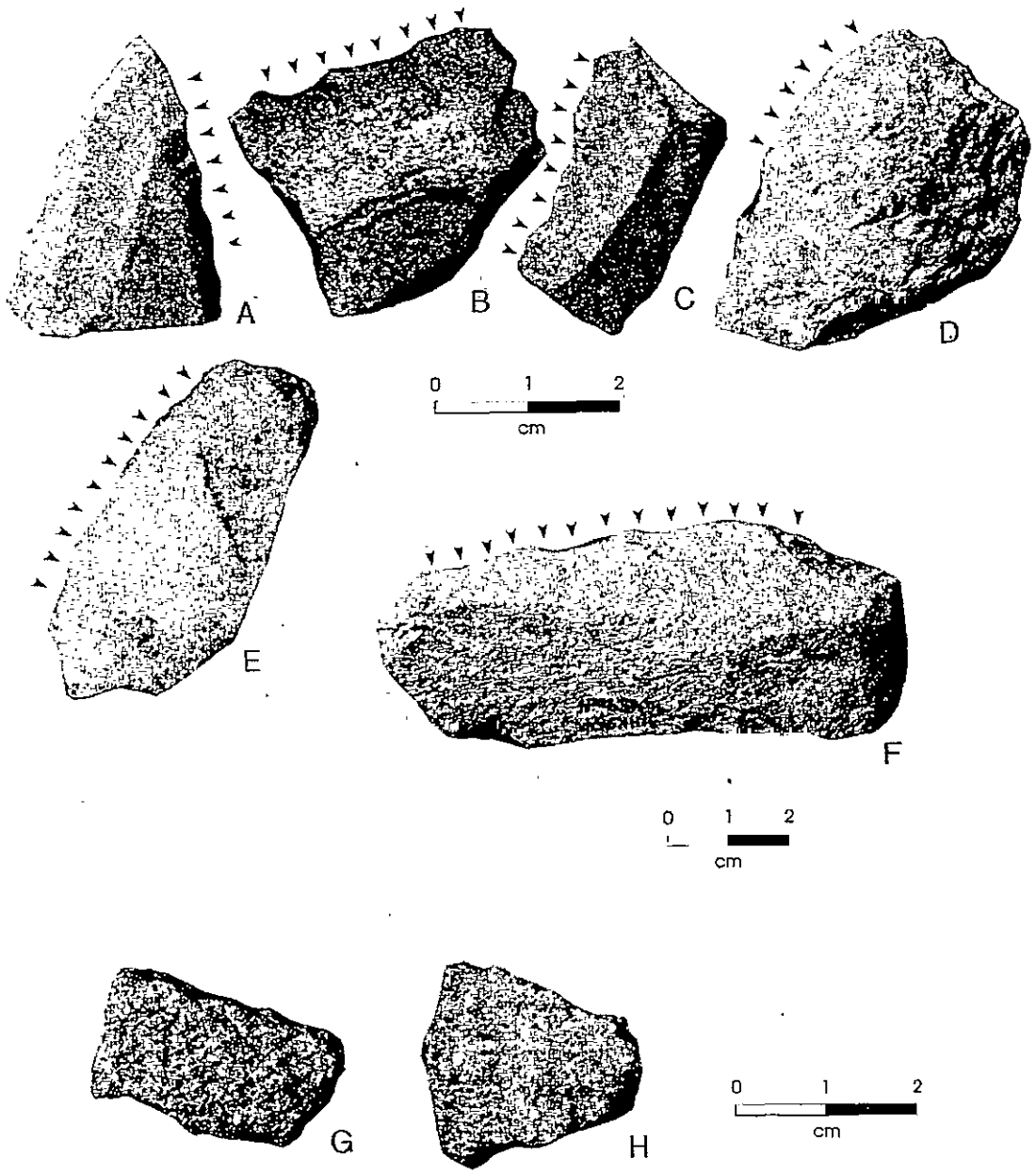

Figure 56. Used flakes and pottery. A-F, used flakes (31HK582*, 31HK570*, 31HK563*, 31HK23*, 31HK563*, 31HK564*); G-H, Yadkin Fabric Impressed sherds (31HK562*).

management activities are recommended for the remainder of the sites identified in the survey tract.

Chicora's recommendations for site eligibility are partially supported by North Carolina Deputy State Historic Preservation Officer David Brook (letter dated October 14, 1997 to Colonel Robert L. Shirron, Director of Public Works and Environment, Fort Bragg, North Carolina. The SHPO does concur with Chicora's recommendation that site 31HK23* is potentially eligible for inclusion on the National Register of Historic Places. As well, the SHPO concurs with Chicora's recommendations that all other newly located sites were recommended as not eligible due to a lack of research potential. Finally, sites 31HK17* — 31HK22*, which we recommended as not eligible since they could not be relocated during the intensive field investigation, were "not assessed" by the SHPO. This appears to mean that these site locations must continue to be managed by Fort Bragg as potentially eligible, even though no remains were found.

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APPENDIX 1.
SPECIMEN CATALOG

Accession Number: 96417

Site Number: 31HK550*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 4	1	interior metavolcanic flake	
m2	collection unit 1	2	interior quartz flakes	

Accession Number: 96418

Site Number: 31HK551*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 4	1	quartz Kirk Corner Notched	X
m2	" "	1	interior quartz flake	

Accession Number: 96419

Site Number: 31HK552*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	1	interior quartz flake	

Accession Number: 96420

Site Number: 31HK553*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 3	1	interior quartz flake	

Accession Number: 96421

Site Number: 31HK554*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 3	1	quartz cobble shatter	
m2	" "	1	interior quartz flake	

Accession Number: 96422

Site Number: 31HK555*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 2	1	quartz scraper	X
m2	" "	1	interior quartz flake	
m3	collection unit 4	1	interior quartz flake	
m4	" "	1	interior metavolcanic flake	

Accession Number: 96423

Site Number: 31HK556*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	metavolcanic Savannah River Stemmed base	X
a2	collection unit 2	1	quartz biface; mid section	X
m3	" "	1	interior quartz flake	
a4	collection unit 4	1	metavolcanic projectile point tip	X

Accession Number: 96424

Site Number: 31HK557*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	1	secondary quartz flake	

Accession Number: 96425

Site Number: 31HK558*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	quartz biface fragment; central portion	X

Accession Number: 96426

Site Number: 31HK559*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 3	2	metavolcanic projectile point pieces	X
a2	collection unit 4	1	quartz projectile point tip	X

APPENDIX 1. SPECIMEN CATALOG

Accession Number: 96427
Site Number: 31HK560*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 3	1	primary metavolcanic flake	

Accession Number: 96428
Site Number: 31HK561*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	metavolcanic Savannah River Stemmed frag	X
a2	" "	1	possible metavolcanic burin	X
m3	" "	6	interior metavolcanic flakes	
m4	" "	1	quartz shatter	
m5	" "	22	interior quartz flakes	
m6	collection unit 2	1	interior quartz flake	
m7	" "	3	interior metavolcanic flakes	
m8	collection unit 3	41	interior metavolcanic flakes	
m9	" "	4	interior quartz flakes	
m10	collection unit 4	9	interior quartz flakes	
m11	" "	2	quartz shatter	
m12	" "	9	interior metavolcanic flakes	
m13	collection unit 5	2	interior metavolcanic flakes	
m14	" "	2	interior quartz flakes	
m15	collection unit 6	26	interior quartz flakes	
m16	" "	1	secondary quartz flake	
m17	" "	1	interior metavolcanic flake	
m18	N185E200	2	interior metavolcanic flakes	
m19	test unit 10-20cm	1	interior quartz flake	
m20	test unit 40-50cm	1	interior quartz flake	

Accession Number: 96429
Site Number: 31HK562*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	chert Small Savannah River Stemmed	X
p2	" "	2	Yadkin Fabric Impressed rim sherds (mend) 4.20g	X
		6	small sherds 17.33g	X
m3	" "	1	interior quartz flake	
m4	" "	5	interior metavolcanic flakes	
p5	collection unit 2	1	largeYadkin sherd 21.60g	X
		7	small sherds 22.26g	X
m6	" "	3	interior quartz flakes	
m7	" "	4	interior metavolcanic flakes	
p8	collection unit 4	1	small sherd 2.85g	X
m9	" "	1	interior quartz flake	
m10	" "	1	raw material/ quartz 28.17g	
a11	collection unit 5	1	metavolcanic Guilford Lanceolate	X
p12	" "	9	Yadkin Fabric Impressed small sherds 28.25g	X
m13	" "	1	interior quartz flake	
m14	" "	1	raw material/ quartz 33.49g	
m15	collection unit 6	1	interior quartz flake	
m16	" "	2	interior metavolcanic flakes	

Accession Number: 96430

Site Number: 31HK565*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	metavolcanic projectile point tip	X
m2	collection unit 2	2	interior quartz flake	
m3	collection unit 3	1	interior quartz flake	

Accession Number: 96431

Site Number: 31HK566*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	quartz biface fragment	X
m2	" "	10	interior quartz flakes	
m3	" "	2	interior metavolcanic flakes	
a4	collection unit 2	1	small quartz Palmer Corner Notched	X
m5	" "	4	interior quartz flakes	
a6	collection unit 3	1	metavolcanic Caraway	X
m7	" "	1	interior metavolcanic flake	
a8	collection unit 5	1	metavolcanic Palmer Corner Notched	X
m9	" "	8	interior quartz flakes	
m10	" "	1	interior metavolcanic flake	
a11	collection unit 6	1	small quartz Kirk Stemmed	X
a12	" "	1	possible scraper frag/ quartz	X
m13	" "	3	interior quartz flakes	
m14	" "	2	interior metavolcanic flakes	

Accession Number: 96432

Site Number: 31HK567*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 2	1	metavolcanic end scraper	X
m2	collection unit 3	1	interior quartz flake	

Accession Number: 96433

Site Number: 31HK568*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	8	interior quartz flakes	
a2	collection unit 2	1	quartz biface fragment	X
m3	" "	8	interior quartz flakes	
a4	collection unit 3	1	quartz biface fragment	X
m5	" "	1	interior quartz flake	
m6	collection unit 4	3	interior quartz flakes	
m7	collection unit 5	1	interior metavolcanic flake	
m8	" "	5	interior quartz flakes	
m9	collection unit 6	1	interior quartz flake	
a10	N185, E170	1	quartz biface	X
m11	N230, E215	1	interior quartz flake	
m12	test unit 19	1	interior quartz flake	

Accession Number: 96434

Site Number: 31HK569*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 4	2	interior quartz flakes	
m2	" "	1	interior metavolcanic flake	

Accession Number: 96435

Site Number: 31HK570*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 2	1	interior metavolcanic flake	
a2\1	collection unit 3	1	used mtavolcanic flake	X
a2\2	" "	1	quartz scraper	X
m3	" "	12	interior metavolcanic flakes	
m4	" "	1	raw material/ chert 2.86g	
m5	" "	1	interior quartz flake	
m6	collection unit 4	2	interior quartz flakes	
m7	" "	5	interior metavolcanic flakes	
m8	collection unit 5	5	interior metavolcanic flakes	
m9	" "	2	interior quartz flakes	
a10	collection unit 6	1	metavolcanic biface	X
m11	" "	4	interior metavolcanic flakes	
m12	collection unit 7	1	interior quartz flake	
m13	" "	1	interior metavolcanic flake	
m14	collection unit 8	1	interior quartz flake	
m15	" "	1	interior metavolcanic flake	

Accession Number: 96436

Site Number: 31HK571*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 2	1	quartz projectile point tip	X

Accession Number: 96437

Site Number: 31HK572*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	quartz Caraway Triangular	X
m2	" "	1	interior metavolcanic flake	

Accession Number: 96438

Site Number: 31HK573*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	2	quartz biface fragment	X
a2	" "	2	used metavolcanic flake	X
m3	" "	12	interior metavolcanic flakes	
m4	" "	12	interior quartz flakes	
a5	collection unit 2	1	quartz preform	X
a6	" "	1	quartz Morrow Mtn. base fragment	X
a7	" "	1	metavolcanic biface fragment	X
a8	" "	1	quartz biface fragment	X
m9	" "	16	interior metavolcanic flakes	
m10	" "	12	interior quartz flakes	
m11	collection unit 4	6	interior quartz flakes	

Accession Number: 96439

Site Number: 31HK574*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 3	1	interior metavolcanic flake	
m2	T78; ST48	1	interior metavolcanic flake	

Accession Number: 96440

Site Number: 31HK575*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 2	1	interior metavolcanic flake	
m2	collection unit 3	1	metavolcanic primary flake	
a3	collection unit 4	1	metavolcanic biface fragment	X
m4	" "	1	interior metavolcanic flake	

Accession Number: 96441

Site Number: 31HK576*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 2	2	interior metavolcanic flakes	
a2	collection unit 3	1	metavolcanic Uwharrie	X
m3	collection unit 4	1	interior metavolcanic flake	

Accession Number: 96442

Site Number: 31HK577*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	2	interior metavolcanic flakes	
m2	collection unit 2	1	primary metavolcanic flake	
m3	" "	4	interior metavolcanic flake	

Accession Number: 96443

Site Number: 31HK578*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 3	1	quartz projectile point base	X

Accession Number: 96444

Site Number: 31HK579*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 2	1	interior quartz flake	

Accession Number: 96445

Site Number: 31HK580*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 3	1	quartz Yadkin	X

Accession Number: 96446

Site Number: 31HK581*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 4	1	interior quartz flake	

Accession Number: 96447

Site Number: 31HK582*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	metavolcanic biface	X
a2	" "	1	used metavolcanic flake	X
a3	collection unit 4	1	used metavolcanic flake	X
m4	" "	1	interior metavolcanic flake	

Accession Number: 96448

Site Number: 31HK583*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	1	interior metavolcanic flake	
m2	collection unit 3	1	interior quartz flake	
a3	collection unit 4	1	metavolcanic biface	X

Accession Number: 96449

Site Number: 31HK584*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 2	1	metavolcanic biface	X

Accession Number: 96450

Site Number: 31HK585*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	quartz biface	X
m2	collection unit 2	1	interior quartz flake	
m3	collection unit 3	4	interior metavolcanic flakes	
m4	" "	2	interior quartz flakes	
m5	collection unit 4	2	interior quartz flakes	

Accession Number: 96451

Site Number: 31HK586*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	1	interior quartz flake	
m2	" "	1	interior metavolcanic flake	
m3	collection unit 4	1	primary quartz flake	
m4	" "	1	interior metavolcanic flake	

Accession Number: 96452

Site Number: 31HK587*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 2	1	interior quartz flake	

Accession Number: 96453

Site Number: 31HK588*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	1	interior quartz flake	

Accession Number: 96454

Site Number: 31HK589*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 3	2	interior quartz flakes	
m2	collection unit 4	2	quartz shatter	

Accession Number: 96455
Site Number: 31HK23*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	1	interior quartz flake	
m2	" "	3	interior metavolcanic flakes	
m3	collection unit 2	3	quartz shatter	
m4	" "	2	interior metavolcanic flakes	
m5	" "	1	interior quartz flake	
m6	collection unit 3	2	interior quartz flakes	
m7	" "	5	quartz shatter	
a8	collection unit 4	1	metavolcanic Kirk Serrated	X
m9	" "	2	interior quartz flakes	
m10	" "	1	quartz shatter	
a11	collection unit 5	1	quartz biface	X
m12	" "	6	interior quartz flakes	
m13	collection unit 6	32	quartz shatter	
m14	" "	1	primary quartz flake	
m15	" "	134	interior quartz flakes	
m16	" "	1	interior metavolcanic flakes	
a17	" "	1	quartz scraper	X
a18	" "	2	quartz biface fragment	X
m19	" "	6	interior quartz flakes	
m20	collection unit 7	28	interior quartz flakes	
m21	" "	1	interior metavolcanic flakes	
m22	collection unit 8	2	interior quartz flakes	
m23	" "	1	interior metavolcanic flake	
m24	collection unit 9	12	interior quartz flakes	
m25	collection unit 10	2	interior metavolcanic flakes	
m26	" "	27	interior quartz flakes	
m27	" "	4	quartz shatter	
a28	collection unit 12	1	metavolcanic biface	X
m29	" "	13	interior metavolcanic flakes	
m30	" "	35	interior quartz flakes	
a31	collection unit 13	2	used quartz interior flakes	X
m32	" "	10	interior metavolcanic flakes	
m33	" "	1	quartz shatter	
m34	" "	21	quartz shatter	
m35	" "	118	interior quartz flakes	
a36	collection unit 14	1	quartz preform	X
a37	" "	2	quartz scrapers	X
m38	" "	3	quartz shatter	
m39	" "	2	interior metavolcanic flakes	
m40	" "	37	interior quartz flakes	
m41	collection unit 15	1	interior metavolcanic flake	
m42	" "	3	quartz shatter	

Accession Number: 96455
Site Number: 31HK23*

Spec. No.	Location	Number	Description	Class 1
m43	" "	1	interior quartz flakes	
m44	collection unit 16	22	interior quartz flakes	
m45	" "	3	quartz shatter	
m46	" "	3	interior metavolcanic flakes	
m47	" "	1	primary quartz flake	
a48	collection unit 17	2	quartz biface fragments	X
a49	" "	1	used interior quartz flake	X
m50	" "	10	interior metavolcanic flakes	
m51	" "	10	quartz shatter	
m52	" "	1	secondary quartz flake	
m53	" "	227	interior quartz flakes	
a54	collection unit 18	1	used secondary metavolcanic flake	X
m55	" "	15	interior metavolcanic flakes (2 mend)	
m56	" "	1	quartz shatter	
m57	" "	37	interior quartz flakes	
m58	collection unit 19	4	interior metavolcanic flakes	
m59	" "	1	quartz shatter	
m60	collection unit 20	26	interior metavolcanic flakes	
m61	" "	4	interior quartz flakes	
m62	collection unit 21	2	interior quartz flakes	
m63	" "	21	interior metavolcanic flakes	
m64	" "	2	quartz shatter	
m65	collection unit 23	3	interior metavolcanic flakes	
m66	collection unit 24	13	interior metavolcanic flakes	
m67	" "	3	quartz shatter	
a68	collection unit 25	2	metavolcanic biface (2 mend)	X
m69	" "	2	interior quartz flakes	
m70	" "	22	interior metavolcanic flakes	
m71	collection unit 26	7	interior metavolcanic flakes	
m72	" "	3	interior quartz flakes	
m73	" "	1	quartz shatter	
m74	collection unit 28	1	quartz shatter	
m75	" "	2	interior metavolcanic flakes	
m76	" "	32	interior quartz flakes	
m78	collection unit 29	5	interior quartz flakes	
m79	" "	2	interior metavolcanic flakes	
m80	collection unit 30	5	interior metavolcanic flakes	
m81	" "	3	interior quartz flakes	
m82	collection unit 32	2	interior quartz flakes	
m83	" "	5	interior metavolcanic flakes	
m84	" "	55	interior quartz flakes	
m85	" "	5	quartz shatter	

Accession Number: 96455
Site Number: 31HK23*

Spec. No.	Location	Number	Description	Class 1
m86	" "	1	raw material/ metavolcanic (71.12g)	
a87	collection unit 33	1	used interior quartz flake	X
m88	" "	264	interior quartz flakes	
m89	" "	26	interior metavolcanic flakes	
m90	" "	23	quartz shatter	
a91	collection unit 34	1	quartz biface	X
m92	" "	9	interior metavolcanic flakes	
m93	" "	81	interior quartz flakes	
m94	collection unit 35	1	interior metavolcanic flake	
m95	" "	9	interior quartz flakes	
m96	collection unit 37	3	interior quartz flakes	
m97	" "	2	interior metavolcanic flakes	
m98	collection unit 38	9	interior metavolcanic flakes	
m99	" "	1	secondary quartz flake	
m100	" "	64	interior quartz flakes	
a101	collection unit 39	1	quartz biface fragment	X
m102	" "	23	quartz shatter	
m103	" "	15	interior metavolcanic flakes	
m104	" "	252	interior quartz flakes	
a105	collection unit 40	1	quartz biface fragment	X
m106	" "	6	interior metavolcanic flakes	
m107	" "	2	primary quartz flakes	
m108	" "	57	interior quartz flakes	
m109	" "	1	raw material/ quartz (110.15g)	
m110	collection unit 41	1	interior metavolcanic flake	
m111	collection unit 49	3	interior metavolcanic flakes	
m112	collection unit 50	3	interior metavolcanic flakes	
m113	collection unit 51	2	interior quartz flakes	
m114	collection unit 52	1	interior quartz flake	
m115	collection unit 53	3	interior quartz flakes	
m116	" "	1	interior metavolcanic flake	
a117	collection unit 55	1	metavolcanic Morrow Mountain II	X
m118	collection unit 56	1	interior metavolcanic flake	
m119	" "	9	interior quartz flakes	
m120	collection unit 57	1	quartz shatter	
m121	collection unit 59	47	interior quartz flakes	
m122	" "	1	interior metavolcanic flake	
m123	collection unit 60	10	interior quartz flakes	
a124	collection unit 61	1	quartz Kirk Serrated	X
m125	N155E485	1	interior metavolcanic flake	
m126	N215E245	1	interior quartz flake	
m127	TU 41H	2	interior quartz flakes	

Accession Number: 96456
Site Number: 31HK591*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 1	7	interior metavolcanic flakes	
m2	collection unit 2	8	interior metavolcanic flakes	
m3	" "	1	interior quartz flake	
m4	collection unit 3	2	interior quartz flakes	
m5	collection unit 4	1	interior metavolcanic flake	

Accession Number: 96457
Site Number: 31HK592*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 4	1	interior metavolcanic flake	
m2	" "	1	interior quartz flake	

Accession Number: 96458

Site Number: 31HK563*

Spec. No.	Location	Number	Description	Class 1
m1	collection unit 7	8	interior quartz flakes	
m2	" "	2	raw material/ quartz 55.95g	
m3	collection unit 8	16	interior quartz flakes	
m4	" "	4	raw material/ quartz 77.85g	
m5	" "	2	interior metavolcanic flakes	
a6	collection unit 11	1	quartz projectile point tip	X
m7	" "	17	interior quartz flakes	
m8	" "	2	interior metavolcanic flakes	
m9	collection unit 12	2	interior quartz flakes	
a10	collection unit 13	1	possible quartz biface	X
a11	" "	1	quartz stem fragment	X
m12	" "	1	primary quartz flake	
m13	" "	10	interior quartz flakes	
m14	" "	1	quartz shatter	
m15	" "	1	interior metavolcanic flake	
a16	collection unit 14	1	quartz biface fragment	X
m17	" "	7	interior quartz flakes	
m18	" "	1	quartz shatter	
a19	collection unit 15	1	quartz biface fragment	X
a20	" "	1	used quartz flake	X
m21	" "	53	interior quartz flakes	
m22	" "	2	interior metavolcanic flakes	
m23	" "	2	quartz shatter	
a24	collection unit 16	1	quartz biface	X
m25	" "	27	interior quartz flakes	
m26	" "	5	quartz shatter	
m27	" "	2	raw material/ quartz 65.73g	
m28	collection unit 17	3	interior quartz flakes	
a29	collection unit 19	1	possible quartz biface fragment	X
m30	" "	10	interior quartz flakes	
a31	collection unit 20	1	metavolcanic end scraper	X
m32	" "	9	interior quartz flakes	
m33	" "	1	primary metavolcanic flake	
m34	collection unit 22	17	interior quartz flakes	
m35	" "	2	quartz shatter	
m36	" "	1	raw material/ quartz 72.47g	
m37	collection unit 23	1	interior metavolcanic flake	
m38	" "	22	interior quartz flakes	
m39	" "	3	quartz shatter	
m40	" "	1	raw material/ quartz 39.64g	
a41	215N260E	1	used metavolcanic flake	X
m42	" "	1	interior quartz flake	

Accession Number: 96458 cont.

Site Number: 31HK563*

Spec. No.	Location	Number	Description	Class 1
m43	230N230E	1	interior metavolcanic flake	
m44	260N230E	1	interior quartz flake	
m45	test unit 30-40cm	1	interior metavolcanic flake	

Accession Number: 96459

Site Number: 31HK564*

Spec. No.	Location	Number	Description	Class 1
a1	collection unit 1	1	quartz Caraway	X
m2	" "	2	interior quartz flakes	
a3	collection unit 2	1	quartz biface	X
a4	" "	1	large used metavolcanic flake	X
m5	" "	14	interior quartz flakes	
m6	collection unit 3	12	interior quartz flakes	
m7	collection unit 4	6	interior quartz flakes	
m8	test unit	1	interior quartz flake	